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Volume XX

B. K. Shishkin and S. V. Yuzepchuk, Editors

Labiatae

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Volume XX

Labiatae

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Characteristics of the Labiatae and key for the genera

Genera: Teucrium, Scutellaria, Sideritis, Meehanina, Neustruevia.....	Arranged by S. V. Yuzepchuk
Genus Ajuga	Arranged by V. V. Pis'yaukova
Genus Amethystea.....	Arranged by E. V. Volkova
Genera: Rosmarinus, Lavandula, Dracocephalum	Arranged by B. K. Shishkin
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Addenda XIX — Diagnoses plantarum novarum in tomo XX Florae URSS commemoratarum.

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PREFACE

This volume deals with the first part of the Labiatae. It describes 369 species of which ten percent are new. The largest genera are *Scutellaria* (S.V. Yuzepchuk) and *Nepeta* (A.I. Poyarkova). As the latter proved to be too heterogeneous, it was considered necessary to introduce the genera *Drepanocaryum* and *Kudrjaschevia*. In addition to these two genera segregated by Poyarkova from *Nepeta*, Yuzepchuk established *Neustruevia* in the Stachydeae.

Some genera of this family are of economic importance as they include plants yielding essential oil. Of these, *Lavandula* and *Rosmarinus* are grown in the southern regions of the USSR.

The second part of Labiatae is presented in Volume XXI.

Editorial Board

1 Family CXL. LABIATAE JUSS.

Flowers always zygomorphic, with bilateral symmetry, rarely almost regular (*Mentha*, etc.), bisexual or gynodioecious, rarely polyoecious, always heteromeric and diagrammatically very uniform; calyx usually, corolla always 5-merous; lobes of corolla alternate with lobes or teeth of calyx; stamens alternate with lobes of corolla; androecium essentially 5-merous, tetra- or diandrous by reduction; gynoecium distinctly 2-merous, with median transverse carpels.

Calyx variable, always with distinct tube, campanulate, tubular, infundibular, globular, urceolate or legniform, 5-, rarely 4-toothed or lobed or variously 2-lipped (more than 5 teeth in genera with so-called commissural teeth, in *Marrubium*, *Ballota* and others 6-10, in *Molucella* and others up to 13; calyx-tube straight or curved, in some cases one-sided (due to dorsal flattening), with squamiform or utricular dorsal projections (*Scutellaria*), and other features; limb of calyx likewise regular or irregular, with a range of variability from obsolescent lobes (*Lavandula*) or acute triangular teeth (*Mentha*, *Stachys*, etc.) to very large, coriaceous, colored lobes with reticulate venation (*Hymenocrater*, etc.). There are three basic types of 2-lipped calyx: 1) formula $\frac{3}{2}$, with 3 lobes in the upper lip and 2 in the lower lip (*Salvia*, *Melissa*, *Satureja*, *Thymus*, etc.), a bilabiate calyx with entire lips being regarded as a modification of this type; 2) formula $\frac{1}{4}$ (some species of *Teucrium*, *Dracocephalum*, *Wiedemannia*, *Ocimum*), with transition toward the $\frac{3}{2}$ formula where the lateral teeth or lobes of the calyx are not involved in the formation of the lips (*Plectranthus*); 3) formula $\frac{5}{0}$, with cleft lower lip (*Majorana*). The calyx is often more or less markedly accrescent, it is usually persistent in fruit, with nutlets ripening in the tube; sometimes it separates into two segments, one falling away, the other persistent (*Scutellaria*). Normally, the calyx has 5 principal nerves reaching the apex of the teeth and 5 secondary nerves terminating at the sinuses. The total number of nerves is often increased to 15 as a result of parallel doubling of the secondary nerves (*Nepeteae*, *Hyssopus*); in other cases only the lower secondary nerves are doubled and the calyx becomes 13-nerved (it should be noted that very often the secondary nerves are doubled only in the middle or the lower third of the calyx-tube, and so the number of nerves has to be determined at the appropriate level. Corolla sympetalous, usually divided into tube and limb, the tube mostly cylindrical or enlarged above, erect or variously curved or twisted, of uniform width or expanded above into a wide throat, rarely campanulate; tube naked within or with a hairy ring lying below attachment of stamens forming a protective mechanism for nectar (nectarostegium); limb of corolla sometimes almost regularly 4-merous (*Mentha*, *Lycopus*, *Dysophylla*), more often distinctly 2-lipped or 1-lipped. Three types of lip structure may be distinguished: 1) most common is a corolla of the $\frac{2}{3}$ type, with the upper lip flat (*Hyssopus*, *Satureja*,

Origanum, Thymus) or concave or convex (Galeopsis, Lamium, Stachys), and the middle lobe of the lower lip usually larger than the lateral and of different shape; 2) the corolla of most Ocimoideae is of the $\frac{4}{1}$ formula, the single lobe of lower lip narrow and flat (Ocimum), concave (Plectranthus), navicular, etc.); 3) corolla of the $\frac{9}{5}$ type, due to the tube being cleft above, all five lobes forming a lower lip (Teucrium); there is a transitional type of corolla with the lateral lobes in intermediate position, referred to the upper lip by some authors and to the lower lip by others. Various shaped projections, called "pleuridia," frequently occur on the lobes; they are filiform on the lateral lobes in

3 Lamium, rounded in Teucrium, and rounded on the lower lobe in Nepeta, Dracopcephalum, Salvia, Stachys, Lamium, etc. Stamens commonly 4, attached to corollatube, usually didynamous, the upper (posterior) mostly shorter or rarely longer than the lower (anterior) (Nepeteae), more rarely subequal (Mentha) or reduced to 2 and then the upper pair represented by staminodes or completely suppressed (Rosmarinus, Salvia, Lycopus, etc.), very rarely only the upper pair developed, the lower being absent or reduced to staminodes (Orthodon). Filaments free, usually filiform, rarely connate into a sheath, sometimes bearing processes (apophyses) or hairy; anthers introrse, often 2-celled, globose, ovoid or oblong-linear, dehiscing longitudinally, mostly alike, but deviations from this norm occur: thus, in Salviae the anterior cell is obsolete or has another function, in Sideritis and Scutellaria the lower stamens have only one fertile cell, etc. The cells are normally parallel, but marked variations occur: the cells may be divergent or divaricate or even connivent apically and fusing into a single cell (Lavandula, Marrubium, Ocimoideae). The connective is variable: in Ocimoideae obsolete, in Satureieae strongly developed, in Meriandreae forming a wide ledge from which anther-cells are suspended, in Salviae filiform-elongate. Pollen grains usually ellipsoid, with 3-6 furrows. Gynoecium always 2-merous, formed by 2 carpels but soon becoming seemingly 4-merous by constriction and false partitions. Ovary superior, sessile, rarely borne on a gynophore, 4-parted to base, rarely 4-lobed. A thickened, fleshy hypogynous disk is usually formed by processes of the receptacle; it is uniformly developed or 2-4-lobed and then its lobes as a rule alternate with those of the ovary, the lower lobe usually functioning as nectary, larger than others and differing in shape, the upper lobe rarely enlarged; lower part of the disk sometimes (subfamily Scutellarioideae) forming a gynophore; in the Lavanduloideae the lobes of the disk are exceptionally opposite those of the ovary. The style usually develops from the base of ovary lobes, but it may be incompletely gynobasic or even subapical in rare cases (Ajugoideae, etc.); it is usually glabrous, sometimes hairy (species of Salvia), rarely

4 simple, usually 2-partite at apex, the branches lobed or acute (in Sideritis etc. one branch lobelike, the other acute), often very unequal; ovules solitary in each ovary cell, nearly always anatropous, with micropyle facing downward, in some Ajugoideae inserted above the base of the ovary cell, semianatropous (Ajuga); in the Scutellarioideae amphitropous, concave or incurved. Placentation axial, mostly basiaxial; integument usually thin. Fruit commonly of 4 equal, glabrous, hairy or tuberculate nutlets; areola (scar of attachment) small, basal, rarely large, ventral (Ajugoideae), very rarely subdorsal. Seed solitary in each nutlet, erect, very rarely transverse and curved, with thin testa; endosperm absent or scanty; embryo with flat, rarely convex or folded, somewhat fleshy cotyledons parallel to fruit axis, rarely transverse; radicle short, downturned, exceptionally curved, adjacent to cotyledons or lying on one of them (Scutellarioideae).

Herbs (annual or perennial) or shrubs, very rarely (in tropics) trees or climbers, mostly aromatic, usually (not always) with epidermal glands. The main root usually persists throughout the life of the plant, very rarely (in moist habitats) it dies toward the end of the first vegetative season (*Scutellaria*, *Stachys palustris*, *Mentha*); the roots are sometimes thickened and serve as storage organs (species of *Nepeta*, *Phlomis*, *Scutellaria*, etc.). Stems usually 4-angled, branches mostly opposite, sometimes whorled. Leaves usually opposite, rarely whorled (*Dysophylla*, etc.), simple, the blades entire, toothed, lobed, cut, etc. Spines rather rare, by transformation of upper leaves or their teeth (*Chamaesphacos*) or bracts and bracteoles or merely their nerves (*Lagochilus*). Inflorescence cymose, two cymes from a pair of leaves forming an apparent whorl [pseudowhorl]; bracteoles usually 2, small, in monochasial cymes only one of each pair developed (*Lamium*, *Satureja*, etc.), more rarely both suppressed (*Teucrium*, *Prunella*, etc.). Flowers rarely solitary in axils of cauline leaves or bracts (*Scutellaria*, etc.), mostly crowded in the axils and forming so-called apparent whorls (verticillasters), each consisting of 2 cymose inflorescences subtended by opposite leaves; in its simpler form the verticillaster represents a 3-flowered dichasium (*Dracocephalum moldavica*, *Salvia pratensis*, *Brunella*, etc.); mostly each cluster composed of dichasia which pass over into a pair of monochasial cymes; these may be few-flowered (*Amethystea*, *Lamium*, etc.) or many-flowered (*Nepeta*, *Ballota*, *Satureja*, *Lycopus*, etc.); the axes of all verticillasters may be much reduced (*Galeopsis*, *Lycopus*, etc.) or reduction may involve all axes but one (*Mentha*, *Ocimum*, etc.) and then the entire cluster may be borne on a common peduncle; in some cases all the axes are developed; all verticillasters may be axillary or crowded at the apex of the stem, and then the upper leaves are usually transformed into distinctive bracts and the entire inflorescence becomes an apparent spike (spicastrum), apparent panicle or umbellate inflorescence; when strongly contracted and congested the spike becomes a head; in some species all flowers are crowded toward one side of the main axis, producing a secund or dorsiventral inflorescence (*Teucrium*, *Scutellaria*, *Nepeta*, *Salvia*, etc.); dorsiventrality is more pronounced when the bracts are opposite the flowers (e.g., *Elsholtzia*).

A large family of cosmopolitan distribution, but especially abundant in the Mediterranean region (broadly conceived) and in mountainous countries of the subtropics; it does not reach the Arctic region nor is it typical for high mountains. Several thousand species in over 300 genera are known (adoption of a narrower concept of genera would produce many more).

Major credit for the classification of the Labiatae is due to the English scientist Bentham. The two editions of his monograph (1832-1836 and 1848) were accepted as standard for many years. However, at the end of the last century the Swiss botanist Briquet revised this classification. He placed the Ajugoideae and Prostantheroideae, characterized by their non-gynobasic style, at the head of the family. He pointed out their affinity to Verbenaceae (actually referring to them as Verbenoids) and their distinctiveness from the other subfamilies. It was Briquet, too, who separated the very unique subfamily Scutellarioideae. In his treatment of the Stachydoideae he radically departed from Bentham by considering it as the nucleus of the entire family. Briquet's classification of Labiatae was incorporated in Engler's system of plant families and has therefore been adopted in the present work. The imperfections of this classification are obvious; one of them, for example, would be the high rank given to the Satureieae and, in particular, to the Menthinae, though the simple structure of their flowers must be considered primitive.

6 In the generic key, we have retained Briquet's classification as far as possible, so as to present it to the users of the "Flora." Yet, to facilitate the use of the key, we had to make significant modifications in many instances. More particularly, the generic breakdown as presented in the "Flora" is more far-reaching than in Briquet's classification; also quite a few new genera have since been described.

Economic importance. The economic importance of the Labiatae is largely due to their specialized glands which excrete essential oils. Many species yield essential oil used in perfumery, cookery and medicine. Some produce edible tuberlike rhizomes; many are cultivated as ornamentals. For further details, see notes to genera and species.

Key to Genera

1. Style inserted above base of lobes of ovary; nutlets with lateroventral attachment, the large areola (scar of attachment) extending over half the height of the nutlet; corolla 1-lipped or apparently so owing to underdeveloped upper lip, rarely 2-lipped (*Amethystea* and *Rosmarinus*) (subfamily Ajugoideae). 2.
- + Style inserted at base of lobes of ovary, i.e. basal or gynobasic; nutlets with basal, very rarely basidorsal or ventral attachment, the areola usually small, very rarely large; corolla not 1-lipped 5.
2. Corolla 1-lipped or apparently so, rarely 2-lipped and then the upper lip not concave; stamens 4, rarely 2; anthers 2-celled; nutlets rugose (tribe Ajugeae) 3.
- + Corolla distinctly 2-lipped, the upper lip concave; stamens 2; anthers 1-celled; nutlets smooth (tribe Rosmarineae) 1243. **Rosmarinus** L.
3. All 4 stamens well developed; corolla 1-lipped or apparently so 4.
- + Only 2 lower stamens developed, the upper 2 reduced to staminodes; corolla 2-lipped 1242. **Amethystea** L.
4. Corolla essentially 2-lipped but appearing 1-lipped because of the pronounced disparity of the lips: the upper lip very short, 2-partite or 2-lobed, the lower large, with highly developed middle lobe 1240. **Ajuga** L.
- + Corolla genuinely 1-lipped, all 5 lobes declined, lying decidedly below the stamens and style, exerted from the 2 upper lobes and forming a single lower lip 1241. **Teucrium** L.
5. Calyx 2-lipped, the entire short lips of 2 parts or segments, the upper segment usually with rounded, concave dorsal scale, rarely with a bladderlike appendage or unappendaged, usually deciduous, the lower segment frequently persistent; upper lip of corolla apparently 3-lobed, its lateral lobes adnate to the middle lobe, rarely free and then it may also be included in the lower lip (subfamily Scutellarioideae). 1244. **Scutellaria** L.
- + Calyx different; upper lip of corolla (in our genera) usually not 3-lobed. 6.
6. Lobes of disk oblong-rounded, opposite lobes of ovary and covering their lower part; nutlets with basidorsal areola. Perennial plants, cultivated (in USSR); leaves linear-lanceolate, with revolute margins; calyx 2-lipped, the upper lip with 1 tooth, the lower with 4 teeth (subfamily Lavanduloideae). 1245. **Lavandula** L.

- + Lobes of disk (if distinct) alternate with those of ovary (the large, crescent-shaped appendages enveloping the nutlet in *Drepanocaryum* (described at the next stage) should not be mistaken for disk lobes). 7.
- 7. Disk with 4 large crescent-shaped appendages alternating with disk lobes and enveloping the base of ovary cells (and nutlets) obsolescent in fruit; areola large, basiventral. Annuals, with small flowers; calyx pellucid, scarious, with 18–20 nerves, obliquely inflated at base; 4 fertile anthers (subfamily *Drepanocaryoideae*) 1246. ***Drepanocaryum*** Pojark.
- + Disk without appendages; areola small, usually basal; calyx different. 8.
- 8. Stamens included in corolla-tube or exserted, ascending or projecting forward (subfamily *Stachydoideae*) 9.
- 8 + Stamens exserted, descending, appearing to lie on slightly concave, 1-lobed entire lower lip of corolla; upper lip rounded, with 4 shallow even lobes (subfamily *Ocimoideae*). 68.
- 9. Stamens (and pistil) included in corolla-tube, this usually enclosed in the calyx, very rarely stamens exserted 10.
- + All stamens, or at least the 2 longer ones, more or less exserted; corolla-tube mostly (though not in all genera) not enclosed in calyx 15.
- 10. Corolla-tube narrow, exserted from calyx, the upper lip narrow, nearly flat; nutlets narrow, oblong (nearly linear). Annuals (Central Asia). 1247. ***Tuspeinantha*** Durand.
- + Corolla-tube enclosed in calyx; nutlets ovoid or ellipsoid. Perennials, rarely annuals 11.
- 11. Corolla very small, not exserted from calyx-tube; corolla-tube without a ring of hairs; verticillasters 4 or 5, very distant, 2-flowered. Densely tomentose perennials, with oblong entire leaves 1283. ***Phlomidoschema*** (Benth.) Vved.
- + Limb of corolla exserted from calyx-tube; verticillasters many-flowered. 12.
- 12. Anthers with divaricate cells; calyx 5–10-toothed; verticillasters axillary, in axils of ordinary leaves. Plants usually perennial (very rarely annual) 13.
- + Anthers of upper stamens with divergent cells; calyx 5-toothed; verticillasters in false spike, subtended by differentiated bracts, or axillary and then plants annual 1250. ***Sideritis*** L.
- 13. Calyx 5–10-nerved, with 5–10 equal or unequal teeth; corolla-tube with a faint and uneven ring of hairs or glabrous inside; upper lip of corolla nearly flat or concave; filaments glabrous; base of leaves not sagittate 14.
- + Calyx 10-nerved, with 5 equal teeth; corolla-tube with well developed ring of hairs; upper lip of corolla slightly inflated; filaments villous-hairy; base of leaves sagittate 1280. ***Metastachys*** Knorr.
- 14. Calyx 5–10-toothed; corolla-tube with a faint and uneven ring of hairs; upper lip notched or 2-fid; leaves orbicular or ovate, usually crenate 1248. ***Marrubium*** L.
- 9 + Calyx 5-toothed; corolla-tube without ring of hairs; upper lip entire. Leaves rounded, palmatifid 1249. ***Lagopsis*** Bge.
- 15. Anther-cells spreading, divergent or parallel, oblong or ovoid, not confluent or indistinctly confluent at apex, not disposed in one plane after dehiscence 16.
- + Anther-cells spreading, globular, confluent at apex, disposed in one plane after dehiscence (tribe *Pogostemoneae*) 67.

16. Connective of 2 fertile lower stamens linear-filiform, loosely or firmly jointed with filament, its posterior limb bearing a normally developed linear cell, the anterior limb naked or bearing a modified barren cell (tribe Salviae) 17.
- + Stamens different. 18.
17. Calyx green or violet (in our species); lips of fruiting calyx unchanged or slightly modified, the upper lip distinctly 3-toothed. 1285. **Salvia** L.
- + Calyx pink or yellow (in our species); fruiting calyx with strongly accrescent, coriaceous, netted-veined lips, the upper lip entire 1286. **Schraderia** Moench.
18. Corolla distinctly 2-lipped, with lips of unequal length, the upper generally concave or convex (flat only in *Chamaesphacos*, in which the leaves are spine-tipped . 19.
- + Corolla distinctly 2-lipped, with nearly flat upper lip, lips faintly differentiated, or nearly actinomorphic 51.
19. Each of the 2 lower fertile stamens bearing 2 parallel, oblong-linear, slightly curved cells, these approximate and hanging from a slightly dilated connective. Central Asian herbs or shrubs, with heavily pubescent 2-lipped calyx and deeply toothed or cut leaves (tribe Meriandreae) 1287. **Perovskia** Karel.
- + Fertile stamens usually 4, or 2 and then connective not dilated and anther-cells ovoid or ellipsoid, not pendulous 20.
20. Upper stamens longer than the lower, the latter sometimes obsolete (tribe Nepeteae) 21.
- + Upper stamens shorter than the lower (tribe Stachydeae) 30.
21. Only upper stamens or all stamens fertile, in any case the lower with very small anthers, mostly concealed in corolla-tube 22.
- + All 4 stamens fertile, with normally developed, equal or nearly equal anthers (in some genera there are staminate individuals with 4 staminodes included in the corolla-tube). 23.
22. Only upper stamens fertile, the lower filiform, apically clavate staminodes; upper lip of corolla narrow, much longer than the lower; calyx campanulate, with nearly straight throat. Annuals 1260. **Hypogomphia** Bge.
- + Lower stamens short, mostly included in corolla-tube, rarely exerted, not staminodial, or upper stamens reduced to sterile staminodes and then plants annual; upper lip of corolla broad, shorter than the lower; calyx 2-lipped. 1257. **Kudrjaschevia** Pojark.
23. Fruiting calyx unchanged or only slightly modified. 24.
- + Fruiting calyx enlarged at apex into a large coriaceous reticulate 5-lobed fringe 1259. **Hymenocrater** Fisch. et Mey.
24. Flowers seemingly inverted by contortion of the corolla-tube; upper lip of corolla, normally overlying stamens and style, occupies the position of the lower lip and vice-versa 1252. **Lophanthus** Adans.
- + Flowers not inverted 25.
25. Pairs of stamens not parallel. 26.
- + Pairs of stamens parallel, arched under the upper lip of corolla 27.
26. Upper stamens declinate, the lower ascending; lobes of disk hardly discernible; middle lobe of lower lip of corolla not unguiculate 1251. **Agastache** Clayt.
- + Upper stamens ascending, the lower directed forward; lobes of disk well developed; middle lobe of lower lip of corolla unguiculate 1253. **Schizonepeta** Briq.

27. Upper lip of corolla with protruding fold inside; pedicels flattened. 1258. **Lallemantia** Fisch. et Mey.
+ Upper lip of corolla smooth inside; pedicels not flattened 28.
28. Calyx usually tubular, 5-toothed, rarely 2-lipped, always without protuberance in
sinuses 29.
+ Calyx distinctly tubular (formula $\frac{1}{4}$ or $\frac{3}{2}$), with a protuberance in some or all
sinuses 1256. **Dracocephalum** L.
- 11 29. Anther-cells diverging at an angle of 180° . Plant without creeping stems 1254. **Nepeta** L.
+ Anther-cells diverging at a right angle. Plant with creeping stems and obtuse leaves
. 1255. **Glechoma** L.
++ Anther-cells parallel. Plant with creeping stems and acute leaves. 1252a. **Meehania** Britton.
30. Calyx 2-lipped, the lower lip turned toward the upper after flowering and covering
the throat (subtribe *Prunellinae*) 1261. **Prunella** L.
+ Calyx different. 31.
31. Calyx broadly campanulate, membranous, with 3-5 broad unequal teeth or lobes
(subtribe *Melittinae*). 1262. **Melittis** L.
+ Calyx tubular, campanulate or rotate, 5-10-toothed, rarely 2-lipped (subtribe
Lamiinae). 32.
32. Upper lip of corolla concave or hooded, rarely convex, usually very hairy . . . 33.
+ Upper lip of corolla flat, glabrous or very sparsely hairy 1284. **Chamaesphacos** Schrenk.
33. Style-branches very unequal, the upper much shorter than the lower, rarely nearly
equal (in many species of *Eremostachys*) and then all or only upper stamens with
basal appendages 34.
+ Style-branches equal or nearly so, filaments without basal appendages. 36.
34. Lower stamens hardly exserted from corolla-tube, the upper not exserted; filaments
unappendaged; nutlets with tufts of hairs at apex; bracts linear-subulate, not con-
nate; leaves ovate, entire 1263. **Pseuderemostachys** M. Pop.
+ Anthers of all stamens much exserted from corolla-tube; filaments generally with,
rarely without appendages 35.
35. Appendages of upper filaments spurlike, smooth; calyx-teeth rather long and narrow,
setaceous from obtuse apex; nutlets pubescent or glabrous; leaves always entire .
. 1266. **Phlomis** L.
+ Appendages of all or only of the upper filaments more or less deeply or pectinately
cleft, very rarely spur-shaped, and then tuberculate-dentate; calyx-teeth very short
and broad, abruptly mucronate from truncate apex, the mucro mostly short; nutlets
very hairy at apex; leaves commonly pinnatisect, rarely entire 1265. **Eremostachys** Bge.
- 12 36. Upper lip of corolla short, half as long as the lower, nearly square, slightly convex;
anther-cells divaricate, apically confluent with a common slit; verticillasters few,
very dense and compact; bracts linear-lanceolate, falcate, rigid, prickly, connate at
base; leaves pinnatisect. 1264. **Neustruevia** Juz.
+ Flowers and other parts different. 37.

37. Lower lip of corolla with 2 hollow hornlike protuberances; anther-cells forming a right angle at anthesis 1268. **Galeopsis** L.
+ Lower lip without protuberances; anther-cells parallel or divergent. 38.
38. Nutlets (lobes of ovary less distinctly so) acutely trigonous, obtuse 39.
+ Nutlets (and lobes of ovary) ovoid, more or less rounded at apex. 48.
39. Calyx tubular or campanulate, and if infundibuliform then filaments joined by thick pubescence; anther-cells with ciliate slit 40.
+ Calyx clearly infundibuliform, with 5 short arched mucronate lobes, filaments not pubescent; anther-cells glabrous 1277. **Molucella** L.
40. Corolla-tube usually elongate, markedly exserted from calyx; calyx-teeth rather soft, not prickly or spinous 41.
+ Corolla-tube included in calyx or slightly exserted; calyx-teeth more or less prickly or spinous, rarely mucronate 44.
41. Calyx-teeth equal or nearly so 42.
+ Calyx 2-lipped, the upper lip 1-lobed, the lower composed of 4 teeth united at base 1272. **Wiedemannia** Fisch. et Mey.
42. Lateral lobes of lower lip of corolla relatively large, ovate, obtuse, entire or emarginate; leaves approximate, broadly rhombic or cuneate-flabelliform, densely velutinous-tomentose. Central Asian high-mountain plant. 1271. **Erianthera** Benth.
+ Lateral lobes of lower lip of corolla and other parts different 43.
- 13 43. Lateral lobes of lower lip of corolla relatively well developed, lanceolate, acute, entire; flowers yellow 1270. **Galeobdolon** Adans.
+ Lateral lobes of lower lip of corolla reduced to small appendages with one to several acute marginal teeth; flowers not yellow. 1269. **Lamium** L.
44. Upper lip of corolla 2-fid or emarginate. Central Asian subshrub, with spines at base of verticillasters (modified bracts) and frequently also in leaf axils 1276. **Lagochilus** Bge.
+ Upper lip of corolla entire; no spines at base of verticillasters or in leaf axils 45.
45. Anther-cells strongly divergent; leaves ovate, entire 46.
+ Anther-cells parallel; leaves of different shape, deeply divided. 47.
46. Flowers 5-7 mm long; corolla scarcely longer than calyx-teeth; calyx-tube without a ring of hairs; stamens slightly exserted; nutlets puberulent at apex 1273. **Chaiturus** Willd.
+ Flowers over 1 cm, commonly 1.5-2 cm long; corolla much longer than calyx, its tube with a ring of hairs; stamens long-exserted; nutlets glabrous 1267. **Stachyopsis** M. Pop. et Vved.
47. Calyx usually small, not more than 9 mm long, funnel-shaped, 5-nerved, with narrowly triangular teeth; corolla pink, enlarged (inflated), with a ring of hairs; upper lip of corolla slightly concave, mostly tapering at base; lower lip usually deflexed 1274. **Leonurus** L.
+ Calyx much larger (13-18 mm), tubular-campanulate, 10-nerved (5 nerves less distinct than the rest), with broadly triangular teeth; corolla yellow, its tube narrow, without ring of hairs; upper lip hooded, not tapering at base; lower lip straight, only the lobules of middle lobe deflexed 1275. **Panzeria** Moench.

48. Calyx enlarged above to an oblique fringe, the upper lip short, entire or 3-toothed, the lower large, angled or 4-toothed. 1278. **Otostegia** Benth.
+ Calyx different. 49.
- 14 49. Calyx tubular-infundibular, with 5-10 (or more) teeth enlarged at base or united into a round toothed fringe; stamens straight after flowering . . . 1279. **Ballota** L.
+ Calyx tubular, with 5 triangular equal acute teeth or upper teeth longer than the lower, rarely calyx 2-lipped (formula $\frac{3}{2}$); after flowering stamens recurved against sides of upper lip 50.
50. Spikelike inflorescences usually dense, short-cylindrical or subcapituliform; corolla-tube exserted, without ring of hairs; anther-cells parallel . . . 1282. **Betonica** L.
+ Spikelike inflorescences different, flowers sometimes axillary; corolla-tube usually included in calyx, with ring of hairs within; anther-cells divergent . . . 1281. **Stachys** L.
51. Corolla 2-lipped 52.
+ Corolla nearly actinomorphic 64.
52. Only lower stamens fertile, the upper reduced to staminodes or absent 53.
+ All 4 stamens fertile (tribe Saturejeae) 54.
53. Calyx narrowly cylindrical, the limb much shorter than the tube; upper lip of corolla entire, the lower 3-lobed. Perennials or annuals, with flowers crowded in capitate, approximate, rarely remote verticillasters (genus of tribe Saturejeae) 1288. **Ziziphora** L.
+ Calyx campanulate, the limb as long as the tube; upper lip of corolla shortly 3-lobed, the lower faintly emarginate. Annuals, with elongate, racemiform inflorescences (subtribe Perillinae) 1304. **Orthodon** Benth. et Oliver.
54. Calyx regular or nearly so, 5-toothed 55.
+ Calyx irregular, at least after flowering distinctly 2-lipped, sometimes 1-lipped . . 57.
55. Calyx 15-nerved, stamens long-exserted from corolla (subtribe Hyssopinae) 1296. **Hyssopus** L.
+ Calyx 10-13-nerved, or 15-nerved and then stamens shorter than upper lip of corolla 56.
56. Flowers subsessile, distinctly bracteolate; calyx 13-nerved, the nerves distinct only at base; calyx-teeth incurved 1298. **Origanum** L.
+ Flowers on long pedicels, with poorly developed bracteoles; calyx distinctly 13-15-nerved, the teeth straight 1291. **Micromeria** Benth.
57. Bracts large, equaling or exceeding the calyx, rounded or rounded-ovate. . . . 58.
+ Bracts small, shorter than the calyx, rarely longer and then of different shape. . . 59.
- 15 58. Calyx cylindrical, the upper lip entire or 3-toothed, the lower small, 2-toothed; spicules small, drooping, with colored bracts 1295. **Amaracus** Gleditsch.
+ Calyx campanulate, with oblique throat, the upper lip subentire, the lower entire or absent; spicules larger, erect; bracts pale green 1297. **Majorana** Moench.
59. Calyx 10-nerved 60.
+ Calyx 13-18-nerved 62.
60. Corolla exserted, ascending below middle and deflexed 1289. **Melissa** L.
+ Corolla included in calyx or exserted, straight or slightly curved 61.
61. Calyx 2-lipped; stamens straight, directed forward, distant, protruding at sides of lower lip 1299. **Thymus** L.

- + Calyx with 5 subequal teeth; stamens curved, ascending, approximate, lying under upper lip 1290. **Satureja** L.
62. Bracts long, setiform, long-hairy; calyx with hairy throat 1293. **Clinopodium** L.
- + Bracts different; calyx with ring of hairs in throat 63.
63. Calyx tubular or tubular-campanulate, not gibbous at base; the triangular teeth not acuminate; pedicels terete 1292. **Calamintha** Lam.
- + Calyx curved-urceolate, constricted at throat and gibbous at base, the teeth acuminate; pedicels flattened 1294. **Acinos** Moench.
64. Calyx usually regular even in fruit, rarely irregular, with 5 equal, rarely unequal teeth, not drooping in fruit (subtribe *Menthinae*). 65.
- + Fruiting calyx 2-lipped, drooping (subtribe *Perillinae*). 1303. **Perilla** L.
65. All 4 stamens fertile, well developed 66.
- + Only the 2 lower stamens fertile, the upper reduced to filiform staminodes. 1300. **Lycopus** L.
66. Calyx 10-nerved; corolla-tube not exerted from calyx; anther-cells parallel. Herbs, with toothed, non-coriaceous leaves 1301. **Mentha** L.
- + Calyx 15-nerved; corolla-tube exerted from calyx; anther-cells divergent. Shrubs, with entire, coriaceous leaves 1302. **Gontscharovia** Boriss.
67. Corolla slightly 2-lipped. Annuals, with opposite leaves and one-sided, compact, spicate inflorescences, the large, orbicular imbricated ciliate bracts facing the flowers 1305. **Elsholtzia** Willd.
- + Corolla with nearly equal lobes. Perennials, with whorled leaves and non-secund cylindrical inflorescences, the small bracts imbricated and not facing the flowers 1306. **Dysophylla** Blume.
68. Lower lip of corolla long, concave, or navicular; corolla-tube exerted 1307. **Plectranthus** L'Hérit.
- + Lower lip of corolla flat or slightly concave, barely exceeding the lobes of upper lip, corolla-tube included in the calyx 1308. **Ocimum** L.

Subfamily 1. **AJUGOIDEAE** Benth. Lab. gen. et sp. (1835) 651; id. in Benth. et Hook. fil. Gen. III. (1876) 1171, emend.; Briq. in Pflanzenfam. IV, 3a (1895) 206. — Style not gynobasic, inserted above the base of ovary lobes. Nutlets with lateroventral attachment, the area of attachment usually large, often more than half the height of the nutlet.

Note. Ajugoideae and the purely Australian Prostantheroideae occupy an isolated position among the Labiatae because of the unique attachment of the style and ovules. Briquet even went so far as to maintain that these two subfamilies were phylogenetically unrelated to the Labiatae proper and proposed their inclusion in the Verbenaceae.

Tribe 1. **AJUGEAE** Benth. in DC. Prodr. XII (1848) 971; Briq. in Pflanzenfam. IV, 3a (1895) 206 et 208. — Calyx 10-nerved, with 5 equal teeth according to formula $\frac{1}{4}$, very rarely $\frac{3}{2}$, or with 2 entire lips; corolla 2-lipped of the $\frac{2}{3}$ type, often with obsolete upper lip or 1-lipped ($\frac{0}{5}$); stamens 4, rarely 2; anthers parallel or divergent; ovary shortly 4-celled or divided for $\frac{1}{3}$ of its height. Nutlets obovoid, with large ventral areola. Embryo straight, with short straight radicle.

17 Genus 1240.* *Ajuga*** L.

L. Sp. pl. (1753) 561; Benth. Lab. gen. et sp. (1835) 690. — *Moscharia* Forsk. Fl. aegypt-arab. (1775) 158. — *Chamaepitys* Link, Handb. 2 (1829) 453. — *Phleboanthe* Tausch in Flora, XI (1828) 322. — *Rosenbachia* Rgl. in Tr. Bot. sada, IX, 2 (1886) 613.

Flowers ebracteate, in 2- to many-flowered axillary verticillasters, sometimes aggregated at ends of shoots to form dense spiciform inflorescences; calyx campanulate or obovoid, 5-toothed or 5-fid, regular except for the sometimes shorter upper tooth; corolla marcescent, 2-lipped, the upper lip very short, bipartite or retuse, the lower long, 3-lobed, the large obcordate or reniform middle lobe more or less deeply cleft; corolla-tube with ring of hairs in lower part, straight, sometimes spirally twisted so that the lower lip is turned upward; stamens 4, exserted or included in corolla-tube, the upper pair longer than the lower; anthers 2-celled at first, the divergent cells at length confluent and dehiscent by common slit; nutlets reticulate or transversely rugose, with large areola, sometimes enveloped by an appendage; ants which feed on these appendages contribute to seed dispersal. Annual, biennial or perennial plants or subshrubs; stems erect or ascending, sometimes stoloniferous; leaves entire or the cauline 3-lobed or 3-partite; bracts usually resembling cauline leaves, rarely differentiated and tinged reddish or blue.

Ajuga has about 50 species widely distributed in the Old World.

Note. Since the publication of De Candolle's "Prodromus" (1848), *Ajuga* has been divided into three sections; of these *Champaepitys* Benth. and *Bugula* Benth. are represented in the Soviet Union. Later authors were mainly engaged in splitting the sections into subsections or series, until Boissier (*Flora orientalis*, IV, 1879, 804) set up the section *Phleboanthe*, consisting of a single species (*A. laxmannii*) and characterized by its truncate corolla-tube. In his very useful treatment of section *Bugula*, Maksimovich (*Diagn. plantar. nov. asiatic.*, V, 1883) established a number of series composed of morphologically similar species. His classification of the section *Bugula* was fully adopted by Briquet (Engl. — Pr. Pflanzenfam. IV, 3a, 1897). The section *Chamaepitys* Benth. was divided by Briquet into two subsections — *Ivae* and *Phleboanthe*, thus incorporating the section *Phleboanthe* Boissier. Beside *A. laxmannii*, Briquet included in *Phleboanthe* all the integrifoliate species — *A. salicifolia*, *A. oblongata*, *A. turkestanica*, *A. chamaecistus*. We find it impossible to combine these Irano-Anatolian species, all characterized by closed corolla-tube, with *A. laxmannii*, and we place them in a separate subsection. *A. laxmannii*, with its open corolla-tube, appears to be a transition to *Teucrium*.

Economic importance. The species *Ajuga* *chia*, *A. pseudochia*, *A. reptans* and *A. genevensis* are widely known for their medicinal properties. The leaves of *A. reptans* contain provitamin A (52γ). Currently, of special interest are *A. chia*, *A. pseudochia* and *A. reptans*, because of their hemostatic and wound-healing action.

- 1. Flowers solitary or rarely paired in the axil of each bract, thus verticillasters 2-flowered, rarely 4-flowered 2.
- + Verticillasters 6- to many-flowered 9.

* Treatment by V.V. Pis'yaukova.

** *Ajuga* may be derived from *aguia*, and this in turn from the Greek *agynos*, meaning joints, referring to the use of the plant in the treatment of gout. Alternately, *ajuga* is a distortion of *abiga*, Pliny's name (*Hist. Nat.*, XXIV) for *Chamaepitys*. Later Latin authors write *Ajuga* instead of *Abiga*.

2. Leaves 3-lobed or 3-partite, only radical leaves entire or toothed; flowers yellow . . . 3.
- + All leaves entire 5.
3. Flowers much shorter than the bracts; calyx about equaling the corolla-tube; nutlets oval, reticulate-rugose. 3. **A. chamaepitys** (L.) Schreb.
- + Flowers about equaling or exceeding the bracts; calyx about half as long as the corolla-tube; nutlets oblong, transversely rugose, reticulate-rugose only at apex . . . 4.
4. Stems and leaves densely covered with spreading hairs; calyx uniformly hairy . . . 1. **A. chia** Schreb.
- + Stems with short appressed hairs on alternate ribs and sparse spreading hairs elsewhere; calyx hairy under the teeth, glabrous below. 2. **A. pseudochia** Shost.
5. Flowers yellow, with purple stripes along the nerves of corolla-tube 6.
- + Flowers bright purple 8.
6. Corolla-tube cleft from upper lip to nearly the middle; calyx-teeth broad, ovate-lanceolate, obtusish; stems simple, thick, villous-hairy, densely leafy, the sessile leaves to 50 mm long 8. **A. laxmannii** (L.) Benth.
- 19 + Corolla-tube entire; calyx-teeth lanceolate, acute; leaves 20–35 mm long; stems branching; plants with spreading or appressed hairs. 7.
7. Leaves lanceolate-elliptic or broadly elliptic, short-petioled, acutish, remote; plants appressed-hairy, with many slender stems; calyx 1/3 as long as corolla, hairy all over 4. **A. salicifolia** (L.) Schreb.
- + Leaves mostly lanceolate, sessile, obtuse, densely covering stem; plants patent-villous; stems with declined branches; calyx 1/4 to 1/5 as long as corolla, glabrous below 5. **A. oblongata** M.B.
8. Stems 3–5 mm in diameter, leafy, glaucescent, very finely soft-pubescent mainly in upper part; leaves 30–60 mm long, 12–18 mm broad; corolla-tube nearly twice as long as calyx; calyx-teeth accrescent in fruit 7. **A. turkestanica** (Rgl.) Briq.
- + Stems 1.5–3 mm in diameter, white, profusely short-branched, hispid as are the leaves; sterile shoots often leafless, becoming woody, spinous; leaves 18–30 mm long, 4–10 mm broad; corolla-tube shorter; calyx-teeth not accrescent 6. **A. chamaecistus** Ging.
9. Plants with creeping stolons 10.
- + Plants non-stoloniferous 11.
10. Radical leaves spatulate, rounded at apex, entire or obscurely and broadly emarginate; lateral lobes of lower lip truncate; calyx glabrous below 10. **A. shikotanensis** Miyabe et Tatewaki.
- + Radical leaves broadly ovate, sinuate-dentate; lateral lobes of lower lip round-tipped; calyx commonly hairy all over 9. **A. reptans** L.
11. Stamens and style included; corolla-tube twisted and thus the lower lip turned upward; low, lanate-villous plants 14. **A. orientalis** L.
- + Corolla-tube straight; stamens and style exceeding the corolla-tube. 12.
12. Inflorescence compact, 4-angled-pyramidal, starting close to soil level; bracts broadly ovate or oblong-ovate, entire, rarely obscurely toothed . . . 13. **A. pyramidalis** L.
- + Inflorescence not 4-angled, starting higher up, at least lower verticillasters remote 13.

13. Plants 8–25 cm high, densely white-villous; bracts entire or sparsely toothed at apex; verticillasters with 8 or more flowers; calyx covered all over with long hairs, the narrow acute teeth longer than the tube 12. *A. multiflora* Bge.
 + Plants 10–40 (50) cm tall, villous-hairy mainly in upper part; bracts 3-lobed or coarsely 3-toothed at apex; verticillasters 4–6-flowered; calyx with woolly hairs mainly in upper part, the triangular-lanceolate teeth shorter than the tube 11. *A. genevensis* L.

Section 1. **Chamaepitys** Benth. Lab. gen. et sp. (1835) 691. — Verticillasters 2-flowered, rarely 4-flowered; corolla yellow or purple, with very short upper lip.

Subsection 1. *Ivae* Briq. in Pflanzenfam. IV, 3a (1897) 210. — Cauline leaves lobate or 3-partite, with very narrow or linear lobes. Upper lip of corolla weakly developed, with obsolete lobes.

1. *A. chia* Schreb. Pl. vert. unilab. (1774) 25; Benth. Lab. gen. et sp. 699; in DC. Prodr. XII, 601, p. p.; C. Koch in Linnaea XXI, 703, p. p.; Ldb. Fl. Ross. III, 449, p. p. (quoad pl. taur. Steveni); Boiss. Fl. or. IV, 802, p. p.; Shmal'g. Fl. II, 346, p. p.; N. Pop. in Mat. fl. Kavk. IV, 3, 11, p. p.; Vizn. rosl. URSR (1950) 407. — *A. intermedia* Boiss. l. c. pro synonym. *A. chiae*. — *A. chamaepitys* Guss. Fl. Sic. Prodr. II (1828) 66; M. B. Fl. taur.-cauc. II, 34 p. p. — *A. chamaepitys* v. *grandiflora* Stev. in Bull. Soc. Nat. Mosc. 30 (1857) 366. — *Teucrium chium* Poir. Encycl. Meth. Suppl. II (1812) 772. — **Ic.**: Sibth. et Sm. Fl. Graec. VI, tab. 524; N. Pop. in Tr. Bot. sada Yur'evsk. univ. XIV, 24, Fig. 2 — fruit.

Perennial, sometimes subshrub, canescent; stems often reddish, erect or ascending, usually evenly covered all round with long, white, sometimes rather coarse hairs, and if hairy on two faces only then the hairs long, spreading; lower leaves entire or apically 3-toothed or 3-lobed, spatulate or oblong-lanceolate, tapering to a long petiole, the upper 3-partite with linear entire lobes, all leaves villous-pilose; flowers axillary, solitary (verticillasters 2-flowered), subsessile, exceeding or about equaling the bracts, usually forming a rather compact, apical spikelike inflorescence; calyx broadly campanulate, long-hairy all over, 4–6 mm long, slightly ribbed, the 5 teeth broadly triangular at base, abruptly acuminate, nearly subulate, the upper teeth shorter than the lower; corolla 19–25 mm long, 4–5 times the length of calyx, yellow, with purple spots and stripes on lower lip and along the nerves of tube, densely covered outside with long white hairs as well as short clavate glandular hairs, the latter more abundant on inner surface; corolla-tube greatly exceeding the calyx, sometimes twice as long, the upper lip slightly 2-lobed, the large middle lobe of lower lip long-unguiculate and broadly cleft, the lateral lobes obovate, obtuse; filaments and style densely covered with long hairs, much exerted; nutlets oblong, 3–4 mm long, reticulate at apex, transversely rugose beneath, rarely with few oblique anastomoses between wrinkles, the areola 2/3 the length of the nutlets. May–September. (Plate I, Figure 2.)

Dry steppe slopes. — European part: U. Dns., Bl., Crim.; Caucasus: Cisc. (Mozdok), W. Transc. **Gen. distr.:** Med., Bal.-As. Min. Described from Chios. Type in Paris.

Note. A very polymorphous species, originating from the eastern Mediterranean area and Asia Minor. In the USSR it is confined to ancient Pontus. One specimen in the herbarium similar to *A. chia* but subglabrous was collected by A. Shelkovnikov (17 VII 1928) near Lake Sevan; it comes very close to *A. glabra* Presl (Fl. Sic. 36) which grows outside the USSR, e.g. near Lake Van.

2. *A. pseudochia* Shost. in Bot. mat. gerb. Bot. inst. ANSSSR (1940) 147; Vozn. rosl. URSS, 407. — *A. chia* Benth. in DC. Prodr. XII (1848) 601, p. p.; Ldb. Fl. Ross. III, 449, p. p.; Boiss. Fl. or. IV, 802, p. p.; Shmal'g. Fl. II, 346, p. p.; Fedch. Rast. Turk. 671; N. Pop. in Mat. Fl. Kavk. IV, 3, 11, p. p. et auct. Fl. Ross. — *A. chia* var. *pseudochamaepitys* N. Pop. l. c.; Grossg. Fl. Kavk. III, 281. — *A. chamaepitys* M. B. Fl. taur.-cauc. II (1808) 34, p. p.; Guss. Fl. Sic. Prodr. II, 66, p. p.; Ldb. l. c. p. p.; Shmal'g., op. cit. p. p.; Boiss. l. c. p. p.; C. Koch in Linnaea XXI, 703; Bge. Lab. Pers. 84, non L. — *A. chamaepitys* var. *grandiflora* Lindem. Fl. Elisabethgr. (1868) 120. — *A. chamaepitys* β . *hirta* Freyn in Oesterr. Bot. Zeitschr. XXVI (1876) 405. — *Teucrium chamaepitys* Falk. Beitr. Kenntn. Russ. Reichs II (1786) 204, non L. — **lc.:** N. Pop. in Tr. Bot. sada Yur'evsk. univ. XIV, 24 — fruit.

22 Perennial, sometimes subshrub; stems 8–30 (37) cm long, branching at base, erect or ascending, alternately appressed-hairy on two faces, sometimes (mostly at nodes) with sparse spreading hairs and thus appearing less hairy than the preceding species; cauline leaves lanate, 3-lobed, the lobes 15–30 (35) mm long, 1.5–3 mm wide; bracts as long as the flowers, rarely slightly longer; flowers solitary in leaf axils, often forming rather dense spikelike terminal inflorescences; pedicels to 2 mm long; calyx campanulate, 4–5 mm long, hairy only in upper part, usually glabrous below, with prominent nerves and acutely triangular teeth to 2–2.5 mm long, shorter than corolla-tube by 2–3 mm; corolla 16–20 mm long, lemon-yellow with purple stripes along nerves and spots on lower lip; lower lip broadly obcordate, sometimes subreniform, broadly emarginate; lateral lobes broad, obtuse; corolla filaments and style less hairy than in preceding species; nutlets oblong, 2.5–3 mm long, reticulate at apex, transversely rugose below, the often oblique anastomoses between the wrinkles relatively numerous. Of frequent occurrence are andromonoecious specimens with bisexual flowers at ends of branches and sterile male flowers below. May–September. (Plate I, Figure 1.)

Steppes, steppe and stony slopes and taluses, chalky outcrops, wastelands, fields, roadsides. — European part: U. Dnp., M. Dnp., V.-Don, Transv., U. Dns., Bes., Bl., Crim., L. Don, L.V.; Caucasus: universal; Centr. Asia: Mtn. Turkm. **Gen. distr.:** Centr. Eur., Med., Bal.-As. Min., Arm.-Kurd., Iran. Described from near Izyum. Type at Kharkov University.

Note. Very close to *A. chia*; constantly confused with either *A. chia* or *A. chamaepitys* because of its intermediate features. Yet, the distribution area and the aggregate of morphological characters qualify it as a separate species. *A. chia* and *A. pseudochia* occur together in southern Italy and on the Aegean and Black Sea coasts. *A. pseudochia* has apparently spread from there to eastern and northeastern Europe, which is today its principal distribution area.

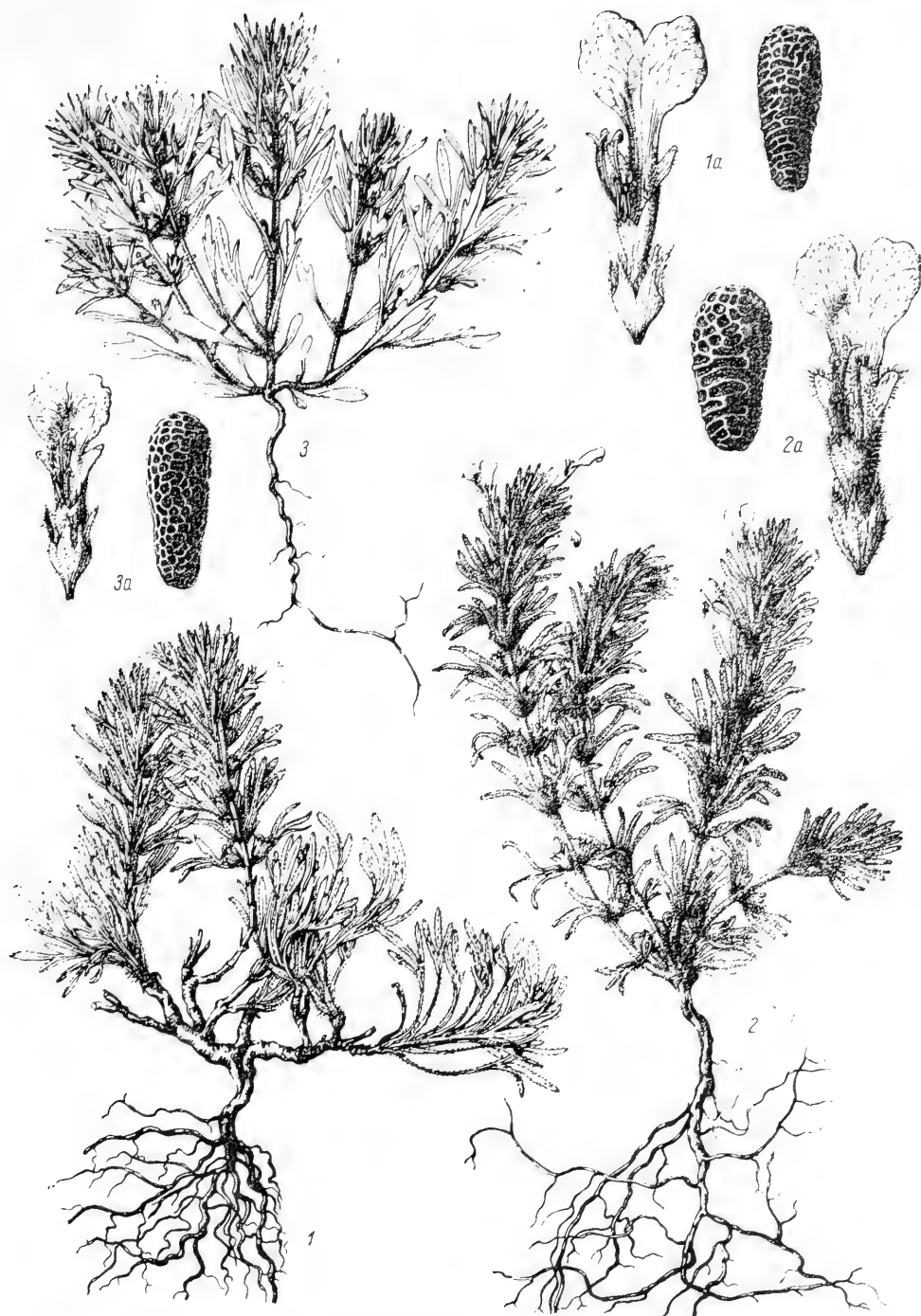


PLATE I. 1 - *Ajuga pseudochia* Schost., general aspect, flower, nutlet; 2, 2a - *A. chia* Schreb., general aspect, flower, nutlet; 3, 3a - *A. chamaepitys* (L.) Schreb., general aspect, flower, nutlet.

Visiani (Flora dalmatica, II, 1847, 222) described a form from Dalmatia resembling *A. chia* and *A. chamaepitys*, and called it *A. chamaepitys* var. *grandiflora*. Judging from his description, this plant is in no way distinguished from *A. pseudochia*. Specimens from Sicily determined as *A. chamaepitys* (L.) Schreb. var. *grandiflora* Vis. have also proved to be *A. pseudochia*.

- 25 3. ***A. chamaepitys* (L.) Schreb.** Pl. vert. unilab. (1774) 24; Benth. Lab. gen. et sp. 699, p. p.; DC. Prodr. XII, 601, p. p.; Ldb. Fl. Ross. III, 449, p. p.; Shmal'g. Fl. II, 346, p. p. — *Teucrium chamaepitys* L. Sp. pl. (1753) 562. — *Bugula chamaepitys* Scop. Fl. carn. (1772) 417. — *Chamaepitys trifida* Dumort. Florul. Belg. (1827) 42. — *Ch. vulgaris* Link, Handb. (1829) 453. — **lc.**: Rchb. Ic. Fl. Germ. XVIII, tab. 1235; N. Pop. in Tr. Bot. sada Yur'evsk. univ. XIV, 24 — fruit.

Annual or biennial; stems often numerous, 5–20 cm high, procumbent or ascending, leaves, except for the radical, deeply 3-partite, with linear entire lobes, the middle one often broader than the others; stems and leaves covered with soft white hairs; bracts longer than flowers, resembling cauline leaves; flowers solitary in leaf axils, yellow with purple spots and stripes on lower lip and corolla-tube; pedicels 1–1.5 mm long; calyx campanulate, 5–6 mm long, equaling the corolla-tube or not more than 1 mm shorter, covered with long white hairs, the acutely triangular teeth to 3 mm long; corolla 10–16 mm long, only 2–3 times the length of calyx, pubescent outside; middle lobe of lower lip obcordate, gradually tapering to claw, slightly 2-fid, with a broad apical slit; lateral lobes broadly lanceolate, ca. 2 mm long, obtuse; filaments and style with scattered long spreading hairs; nutlets ovoid, rarely somewhat oblong-ovoid, to 3 mm long, the entire surface reticulate-rugose. June. (Plate I, Figure 3.)

Dry, often calcareous slopes; mostly wastelands, fields and meadows. — European part: U. Dnp. (western part), U. Dns., Bes. **Gen. distr.:** Centr. and Atl. Eur., Med. (western part), Bal.-As. Min. (Bal.). Described from Portugal. Type in London.

Note. *A. chamaepitys* has a typically West European distribution. It extends eastward only to the upper parts of the Dniester and Pripet. A single specimen from the vicinity of Zemlyansk in the Voronezh region, preserved in the herbarium of the Botanical Institute of the Academy of Sciences of the USSR, was determined by B.M. Kozo-Polyanskii as *A. chamaepitys*. In fact it comes closest to *A. chamaepitys* except for the nutlets which are more coarsely alveolate compared with the type. More collections are needed to determine the eastern boundary of *A. chamaepitys*.

Subsection 2. *Pseudophleboanthe* Pissjauk. — Sect. *Phleboanthe* Briq. in Pflanzenfam. IV, 3 (1897) 210, p. p. — Leaves entire; corolla-tube closed, upper lip broadly and slightly 2-lobed; corolla covered with jointed hairs.

- 26 4. ***A. salicifolia* (L.) Schreb.** Pl. vert. unilab. (1774) 26; M. B. Fl. taur.-cauc. II, 34; III, 388; Benth. Lab. gen. et sp. 699; DC. Prodr. XII, 599; Ldb. Fl. Ross. III, 449; Boiss. Fl. or. IV, 800. — N. Pop. in Mat. Fl. Kavk. IV, 3, 19. — *A. oblongata* Schmalh. Fl. II (1896) 346, p. p. quoad pl. taur. (non M. B. l. c. III, 388, quae est pl. transcaucas.). —

A. rhodopea Velen in Sitzber. böhm. Gesellsch. Wiss. (1892) 19. — *Teucrium salicifolium* L. Mantissa (1767) 80. — **Ic.:** Schreb. Ic. et descr. I, 17, tab. 9; Sibth. et Sm. Fl. Graec. VI, tab. 526.

Perennial, strongly rhizomatous, to 20–30 cm high; stems numerous, often woody at base, simple or rarely branching at base, ascending or spreading, in lower part slender, somewhat nodose, subterete, glabrous, in upper part slightly 4-angled, covered with short crisp hairs, sometimes almost tomentose; leaves distant, short-petioled, broadly lanceolate or lance-elliptic, 25–30 mm long, 10–12 mm wide, acute, entire, rarely 2–3-toothed in upper part, with short stiff hairs above and beneath, sometimes almost strigose; bracts resembling the leaves, exceeding the flowers; flowers to 25 mm long, yellow with purple stripes on corolla-tube and on lateral lobes of lower lip; pedicels to 3 mm; calyx campanulate, 8–10 mm long, not more than half the length of the corolla-tube, glaucous all over with short appressed hairs, the teeth lanceolate, obtuse, upright, equaling or exceeding the tube, the upper tooth often smaller than the others; corolla nearly twice as long as calyx, also finely appressed-hairy, the upper lip with 2 obtuse short lobes, the lower with long lanceolate lateral lobes and narrowly unguiculate deeply cut middle lobe; corolla-tube broadly campanulate at apex; filaments and style pubescent; nutlets oblong, 3–3.5 (4) mm long, reticulate-rugose. May–July. (Plate II, Figure 2.)

Steppes, stony slopes. — European part: Crim. **Gen. distr.:** Bal.-As. Min., Arm.-Kurd. Described from Southwest Asia. Type in London.

5. *A. oblongata* M. B. Fl. taur.-cauc. III (1819) 388; Benth. Lab. gen. et sp. 698; in DC. Prodr. XII, 599; Ldb. Fl. Ross. III, 499; Boiss. Fl. or. IV, 801; Shmal'g. Fl. II, 346, p. p. (quoad pl. transcaucas.); N. Pop. in Mat. fl. Kavk. IV, 3, 18. — *A. salicifolia* Stev. in Mem. Soc. Nat. Mosc. III (1812) 265, non Schreb.

27 Perennial, 10–30 (50) cm high, patent-villous; stems stout, often with sturdy branches; leaves densely covering the stem, narrowly lanceolate or oblong-elliptic, obtuse, entire, 2–4 cm long, 5–10 mm wide, tapering to base, subsessile, the terminal leaves generally shorter than flowers; flowers yellow, on pedicels to 1 mm long, in a rather dense spikelike inflorescence; calyx rounded-ovoid or campanulate, 5–6 mm long, 1/2 to 1/3 the length of corolla-tube, with sparse long hairs confined to upper part, the teeth ca. 3 mm, narrowly lanceolate, acute, the uppermost shorter than the others; corolla 20–25 mm long, yellowish, without purple spots or stripes, thin (the tube almost scarious), with long white hairs and short glands on the outside; corolla-tube infundibular; upper lip slightly 2-lobed; lower lip large, with lanceolate obtuse lateral lobes and reniform retuse middle lobe; filaments and style with scattered hairs; nutlets oblong, reticulate-rugose. May–July. (Plate II, Figure 4.)

Dry steppes. — Caucasus: E. Transc. **Gen. distr.:** Med. (east), Iraq. Described from the estuary of the Kura River. Type in Leningrad.

6. *A. chamaecistus* Ging. ex Benth. Lab. gen. et sp. (1835) 698; in DC. Prodr. XII, 600; Briq. in Pflanzenfam. IV, 3a, 210; Bge. Lab. Pers. 84; Boiss. Fl. or. IV, 801; Grossg. Fl. Kavk. III, 281; Bornmüll. in Bull. Herb. Boiss. 8, 2, 121.

Low subshrub or shrub, with large root and dense divaricate or ascending branches, loosely cespitose; stems and leaves covered with coarse spreading, sometimes bristlelike

hairs; stems slender, 1.5–2 (3) mm in diameter, white, sturdy, nodose; sterile shoots often leafless, woody, nearly spinous; leaves variable: on sterile shoots lanceolate or lanceolate-linear, on the fertile oblong-elliptic or ovate-elliptic, obtuse, entire, sessile, always attenuate at base, slightly amplexicaul, 20–35 mm long, 4–10 mm wide, with thin revolute margins, often canescent, remote in lower part of stem; bracts resembling cauline leaves, about equaling the flowers; flowers solitary, bright purple, 18–25 (not more than 30) mm long; pedicels 2–3 mm long; calyx tubular-campanulate, densely covered with stiff appressed hairs, almost lanate, gray, to 8 mm long; teeth triangular-lanceolate, as long as the tube, not accrescent, the uppermost slightly shorter than the others; corolla (except for lower lip) densely hairy, the thin subscarios tube purple-striped; upper lip with scarcely visible obtuse lobes; lower lip large, the lateral lobes broad, rounded, spreading at an obtuse angle, the middle lobe 10–13 mm wide, short-glandular deeply cut, broadly unguiculate with rounded, slightly incised-dentate lobules; filaments sparsely short-glandular, with a tuft of long hairs below the anthers; style glabrous; nutlets 5–6 mm long, 2 mm wide, longitudinally reticulate-rugose, with very large areola. May–June. (Plate II, Figure 1.)

Slopes of hills, stony slopes of mountains up to 2000 m. — Caucasus: S. Transc. **Gen. distr.** *A. turkestanica* Rgl. — Kurd., Iran. Described from Iran. Type in Paris?

7. *A. turkestanica* (Rgl.) Briq. in Bull. Herb. Boiss. 2 (1894) 711 et in Pflanzenfam. IV, 3a, 210; Lipsk. in Tr. Bot. sada, XVIII, 1, 107. — *Rosenbachia turkestanica* Rgl. in Tr. Bot. sada, IX (1886) 613. — *A. chamaecistus* B. Fedtsch. Rast. Turk. (1915) 671, non Benth. — **lc.**: Tr. Bot. sada, IX (1886) tab. X, fig. 21, a–f, flowers and fruit.

Subshrub with a robust root; stems 40–50 (60) cm long, stout, 3–5 mm in diameter, pale brown, sometimes reddish, rarely more or less whitish below, glabrous, grayish, in upper part finely and softly appressed-hairy like the leaves; leafless, woody and spinous branches usually absent; sterile shoots leafy above; leaves larger than in the preceding species, (30) 45–60 mm long, (12) 14–18 mm wide, oblong-elliptic or obovate, sometimes rhombic, only on short sterile branches occasionally oblong-lanceolate, entire or rarely with 2–4 apical teeth, tapering at base; lower leaves short-petioled, the upper sessile, amplexicaul; pubescence of leaves and other parts sparser than in the preceding species; flowers 25–40 mm long, purple; pedicels 3–4 mm long at flowering, later 6 mm; calyx campanulate or narrowly so, (8) 10–12 mm long at flowering, 13–16 mm in fruit, covered all over with fine short appressed hairs, glaucous, the teeth narrowly lanceolate, nearly as long as calyx-tube, accrescent in fruit to nearly twice their length and becoming broadly lanceolate, foliaceous; corolla-tube long, broadly infundibular, finely appressed-hairy, 2–2½ times as long as calyx; upper lip slightly developed, with 2 obtuse, hardly discernible lobes; lower lip very large, slightly glandular, the lateral lobes broadly lanceolate or ovate, diverging at an acute angle, deeply bipartite, 12–15 mm wide, the middle lobe long-unguiculate, the lobules rounded, faintly undulate-dentate; filaments ribbon-shaped in lower part, glabrous like the style; nutlets oblong-ovoid, 7–9 mm long, 3 mm wide, thinly longitudinally reticulate-rugose, with very large areola. April–July. (Plate II, Figure 3.)

Stony and gravelly mountain slopes, rocks and taluses, to 2500 m. — Centr. Asia: Pam.-Al. (west and southwest). Endemic. Described from Tadzhikistan. Type in Leningrad.

Note. This species is the more northern, mesophyllous race of *A. chamaecistus*, to which it is allied. In spite of Bornmüller's objections to the segregation of *A. turkestanica*

(Bull. Herb. Boiss. 2 sér., 8, 1908, 121), this species is very clearly distinguished from *A. chamaecistus*, even from the "luxuriantly developed specimens" from Northern and Western Iran, to which it is referred. We had at our disposal a specimen of *A. chamaecistus* collected by Bornmüller on 12 V 1902 between Resht and Kazvin (spurs of Elburz Range), with critical notes attached, as well as a specimen collected on 11 V 1904 near Kermanshah and determined by Bornmüller. Study of these plants showed that in respect of vesture, structure of flowers (especially calyx) and character of branches, they belonged to *A. chamaecistus* and were readily distinguishable from the Pamir-Alai forms. More collections are needed from Southern Transcaucasia, Talysh and the western and south-western regions of Pamir-Alai.

Subsection 3. *Phleboanthe* (Boiss.) Briq. in *Pflanzenfam.* IV, 3a (1897) 210, p. p. (quoad typ.); Boiss. *Fl. or.* IV (1879) 804 (pro sect.). — Corolla-tube closed from upper lip to nearly middle, otherwise as in preceding subsection.

8. *A. laxmannii* (L.) Benth Lab. gen. et sp. (1835) 697; in DC. *Prodr.* XII, 599; Ldb. *Fl. Ross.* III, 448; Shmal'g. *Fl.* II, 346. — *Teucrium laxmanni* L. *Syst. veg.* (1784) 526; Georgi, *Beschr. Russ. R.* III, 5, 1077; M. B. *Fl. taur.-cauc.* II, 35; III, 389. — *T. iva* Georgi, l. c. 1076 (non L.). — *T. pseudiva* Güldenst. *Reis. Russl. et Cauc.* (1787) 140. — *Phleboanthe laxmanni* Tausch in *Bot. Zeitschr.* I (1828) 323. — *Ic.*: Rchb. *Ic. Fl. Germ.* XVIII, tab. 1236 (sub *Phleboanthe laxmanni*).

Perennial, with woody branching root; stems stout, to 8 mm in diameter, simple, numerous, densely leafy, erect or ascending, to 20–50 cm long, patent-villous, more copiously so at nodes; leaves oblong- or oval-elliptic, obtuse, 35–45 (55) mm long, 10–12 (30) mm wide, sessile, slightly amplexicaul, entire, on sterile shoots lanceolate, long-attenuate at base, at apex rarely crenate-serrate, grayish with appressed-lanate hairs on both sides; bracts leaflike, exceeding the flowers; verticillasters two-flowered, remote or crowded in
30 spikelike terminal inflorescence; flowers large, to 30–35 mm long, yellow, with dense network of purple nerves; pedicels 3–4 mm; calyx campanulate, 10–15 mm long, woolly-canescens with clavate hairs; calyx-teeth lanceolate or oblong, obtuse, rarely subacuminate, nearly the length of the tube (ca. 5 mm long), the uppermost tooth sometimes slightly smaller than the others; corolla covered with clavate hairs and on lower lip densely short-glandular; tube open; lobes of upper lip small, lanceolate; lower lip very large, reclinate, the lateral lobes broadly oval, the middle lobe long-clawed, 2-fid, with broad oval lobules; filaments and style extending to the tip of lateral lobes of lower lip; style glabrous, with thickish stigma lobes; filaments ribbonlike at base, covered with short clavate hairs; nutlets obovoid, light brown, 4–4.5 mm long, 1.5–2 mm wide, reticulate-rugose, with large areola. May–July. (Plate II, Figure 5.)

Steppes, steppe and chalky slopes, coppices, margins of broadleaved forests in forest steppe and steppe regions. — European part: U. Dnp., M. Dnp., V.-Don, U. Dns., Bes., Bl., Crim., L. Don; Caucasus: Cisc., E. Transc. (?). **Gen. distr.**: Centr. Eur., Bal.-As. Min. Described from cultivated specimens. Type in London.

Section 2. **Bugula** Benth. Lab. gen. et sp. (1835) 692; in DC. Prodr. XII, 525; Briq. in Pflanzenfam. IV, 3a, 210; Maxim. in Mél. biol. XI, 808. — Verticillasters 6- to many-flowered; corolla blue, rarely pink, purple or white, not yellow.

Subsection 1. *Genevenses* Maxim. in Mél. biol. XI (1883) 809 (pro serie). — Leaves tapering at base; corolla-tube straight; stamens and style exserted.

9. **A. reptans** L. Sp. pl. (1753) 561; Benth. Lab. gen. et sp. 694; in DC. Prodr. XII, 595; Ldb. Fl. Ross. III, 446; Shmal'g. Fl. II, 345; Syreishch. Fl. Mosk. gub. III, 115. — N. Pop. in Mat. Fl. Kavk. IV, 3, 27; Fl. Yugo-vost. VI, 134; Kryl. Fl. Zap. Sib. IX, 2992. — *A. repens* Host, Fl. Austr. II (1831) 119; Gölldenst. ex Ldb. l. c. 447. — *A. pyramidalis* Sobol. ex Rupr. Beitr. Pflanzenk. Russ. R. IV (1847) 68. — *A. alpina* Fries, Mant. 3 (1842) 54, non Linn. — *A. barelieri* Ten. Fl. Nap. (1842) tab. 240, fig. 2. — *A. vulgaris* ssp. *reptans* Rouy, Consp. Fl. Franc. (1927) 206. — *Bugula reptans* Scop. Fl. Carniol. (1760) 447. — *B. densiflora* Ten. l. c. tab. 239, fig. 2. — *Teucrium reptans* Crantz, 31 Stirp. Austr. ed. I (1769) 251. — **lc.**: Rchb. Ic. Fl. Germ. XVIII, tab. 1234, Fedch. and Fl. Fl. Evrop. Ross. 800; Syreishch., op. cit. III, 114; Maevsk. Fl. 608.

Perennial, with rooting stolons; stems simple, 15–35 cm long, covered on two faces with fine, appressed hairs, these sometimes interspersed with erect articulate hairs; radical leaves long-petioled, spatulate or spatulate-obovate, broadly sinuate-dentate; lower cauline leaves few, oblong or ovate, sessile, gradually passing into bracts; bracts entire, ovate, sometimes slightly crenate, the lower longer than the flowers, the upper shorter; flowers azure, blue, sometimes white or pink; verticillasters 6–8-flowered, distant below, forming above a rather dense spikelike inflorescence; calyx glandular hairy, almost villous at apex, the lanceolate teeth longer than, rarely as long as the tube; corolla densely glandular hairy outside, the tube not more than half as long again as the calyx, the upper lip deeply 2-lobed, the middle lobe of lower lip rounded, slightly emarginate, the lateral lobes broadly ovate; stamens and style exserted; filaments densely covered with long articulate and short clavate hairs; nutlets globose, pale brown, ca. 2.5 mm long, finely reticulate-rugose. May–July (August).

Wet meadows, forests, forest glades, coppices, wooded slopes. Ascending into high mountains; rare in southern regions. — European part: Kar.-Lap. (south), Lad.-Ilm., Balt., Dv.-Pech., V.-Kama, U. Dns., U. Dnp., L. Don, Transv., L.V. (delta of Volga), Crim.; Caucasus: Cisc., Dag., W. and E. Transc., Tal. **Gen. distr.**: Scand., Atl. and Centr. Eur., Med., Bal.-As. Min., Arm.-Kurd., Iran (northern part). Cultivated in N. Am. Described from Europe. Type in London.

Note. This widespread species is by no means homogeneous. The following forms (apparently ecological) have been described for the USSR: 1) var. *alpina* N. Pop. in Mat. Fl. Kavk. IV, 3 (1916) 30 (*A. alpina* Vill. non Fries) — high-mountain form characterized by a reduced stem with a rosette of radical leaves and a short, dense inflorescence; 2) var. *simplex* Kauffm. Mosk. Fl. (1866) 389 — with very short stolons (sometimes obsolescent), densely hairy stem and large radical leaves. Both forms grow on dry slopes and in dry scrub.

There are also colored forms: var. *albiflora* Tin. (Fl. Luxemb. 1836, 291) and var. *rosciflora* Wildem. et Durand (Prodr. Fl. Belg. III, 1899, 640). For hybrids, see Note to *A. genevensis*.

32 10. **A. shikotanensis** Miyabe et Tatewaki in Transact. Sapporo Nat. Hist. Soc. XIV (1935-1936) 7. — **Ic.**: 1. c. 7, fig. 3.

Perennial, stoloniferous; stems ascending, 15-20 cm long, with patent white hairs on two faces, the hairs usually of two kinds: tangled subappressed-articulate and erect-glandular; radical leaves petiolate, spatulate, round-tipped, subentire, rarely broadly incised with scattered coarse hairs above, subglabrous beneath, with petioles 5-8 cm long; lower cauline leaves petiolate, tapering above, upper leaves and bracts sessile, oblong or oblong-ovate, subentire, round-tipped, with scattered woolly hairs above, glabrate beneath, slightly colored; verticillasters 5-7-flowered; calyx campanulate, with 5 subequal, triangular-lanceolate hairy teeth, the tube subglabrous; corolla ca. 13 mm long, with scattered long hairs and short glands, the tube straight, the upper lip with 2 ovate-triangular lobes, the lower large, rarely recurved, with obcordate middle lobe and oblong truncate lateral lobes; stamens and style slightly exerted; stamens pubescent; style glabrous, the stigma with slightly unequal lobes.

Grass patches along seacoasts and at foot of mountains. — Far East: Sakh. (Kurile Islands). Described from Shikotan Island. Type in University Herbarium, Hokkaido.

11. **A. genevensis** L. Sp. pl. (1753) 561; Benth. Lab. gen. et sp. 694; in DC. Prodr. XII, 596; Ldb. Fl. Ross. III, 448; Shmal'g. Fl. II, 345; Syreishch. Fl. Mosk. gub. III, 115; Fedch. and Fl. Fl. Evrop. Ross. III, 800; N. Pop. in Mat. Fl. Kavk. IV, 3, 22. — **A. alpina** L. Mantissa (1767) 80; Falk, Beitr. Kenntn. Russ. R. 204; M. B. Fl. taur.-cauc. II, 33; III, 388. — **A. pyramidalis** M. B. l. c. II (1808) 32 et auct. plur. florae Ross. med. austr. et cauc. (non L.); Boiss. Fl. or. IV, 799, p. p. (quoad pl. Caucas.). — **A. alpestris** Dumort. Florula Belg. (1827) 42. — **A. foliosa** Tratt. Arch. Gew. I (1829) 25. — **A. latifolia** et **rugosa** Host, Fl. Austr. II (1831) 119. — **A. montana** Dill. ex Rchb. Fl. Germ. exc. (1830-1832) 314. — **A. cryptostylon** Lagreze-Fossat ex Nym. Consp. Fl. Eur. (1881) 567. — **A. vulgaris** ssp. **foliosa**, **alpina**, **genevensis** Rouy, Consp. Fl. Franc. (1927) 206. — **Bugula genevensis** Mill. Gard. Dict. ed. VIII, No. 4. — **B. decumbens** Mill. l. c. No. 2. — **B. tomentosa** Gilib. Pl. rar. et comm. Lithuan. (1785) 17 et Fl. Lithuan. in Delect. Opusc. Bot. II (1793) 323. — **B. alpina** All. Fl. Pedem. I (1785) 45. — **Teucrium genevense** Crantz, Stirp. Austr. ed. I (1769) 253. — **Ic.**: Rchb. Ic. Fl. Germ. XVIII, tab. 1234; Syreishch. op. cit., 115.

35 Perennial, non-stoloniferous with bundles of strongly branching lateral roots; stems 10-40 (50) cm, rarely branching at base, villous-hairy (only on two faces in var. **alpestris** (Dum.) Beck.), sometimes subglabrous at base; radical leaves distant, oblong-spatulate or obovate, strongly crenate-dentate, sometimes almost entire, 4-12 cm long, 2-5 cm wide, tapering to petiole mostly marcescent; lower cauline leaves oblong, in upper part remotely crenate-dentate, cuneate, sessile, gradually passing into bracts; bracts coarsely 3-toothed, often 3-lobed, ovate or broadly ovate, the upper usually shorter than the flowers (longer in var. **longibracteata** Bizzoz.), often colored; all leaves covered on both sides with more or less articulate hairs and sometimes also with short bristles; verticillasters 4-6 (8)-flowered, crowded in a spikelike terminal inflorescence, remote below; flowers 12-18 mm long, sessile; calyx lanate in upper part, slightly glandular, subglabrous at base, 5-6 (7) mm long, 1/2 to 2/5 as long as corolla-tube, the subequal triangular-lanceolate teeth shorter than the tube; corolla blue, rarely pink or white, sparingly pubescent outside (especially

(33)

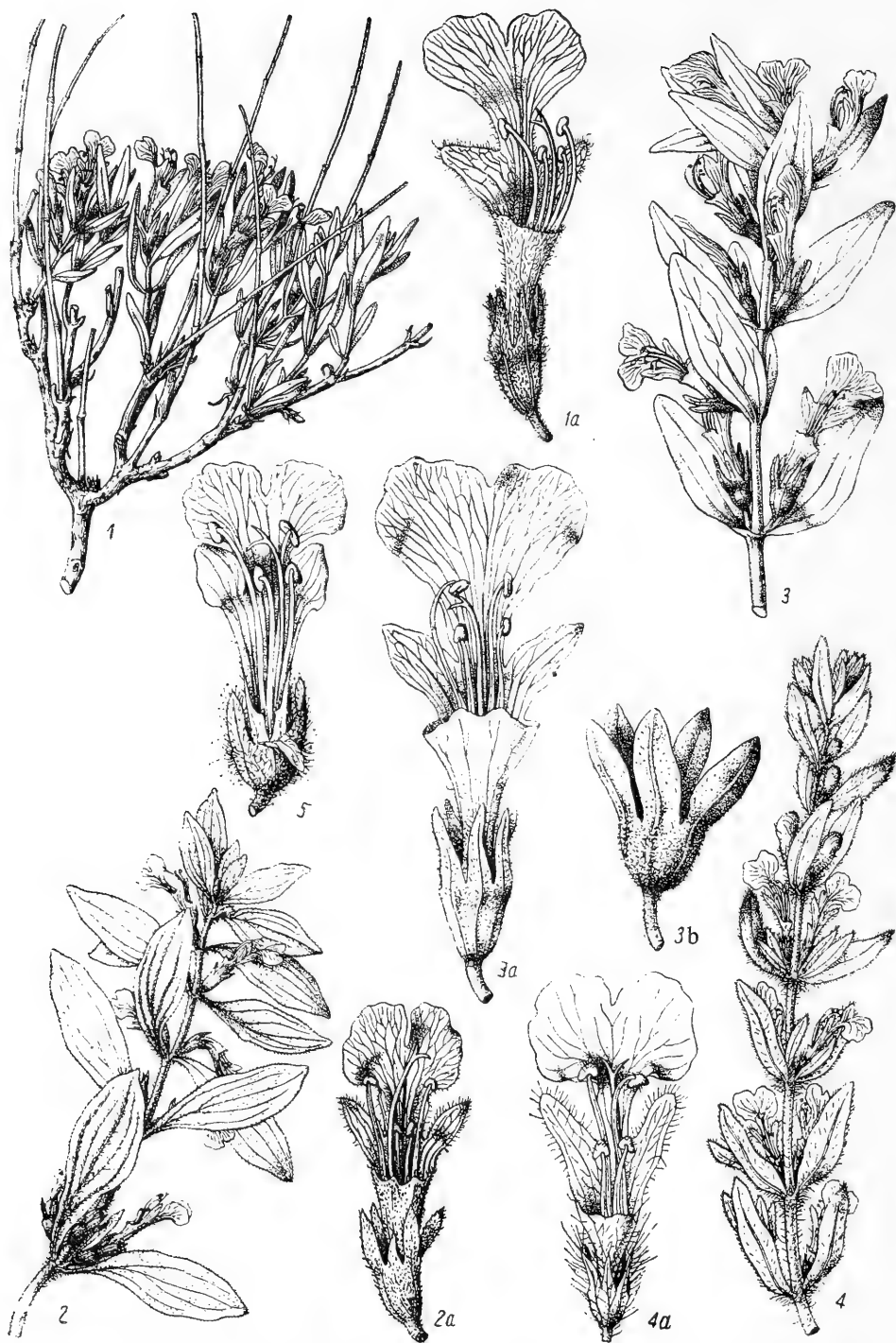


PLATE II. 1 - *Ajuga chamaecistus* Ging., 1a) flower; 2 - *A. salicifolia* (L.) Schreb., part of flowering branch; 2a) flower; 3 - *A. turkestanica* (Rgl.) Briq., part of flowering branch; 3a) flower; 3b) fruiting calyx; 4 - *A. oblongata* M. B., part of flowering branch; 4a) flower; 5 - *A. laxmanii* (L.) Benth., flower (one of the calyx teeth bent).

the tube); lobes of upper lip small, truncate; middle lobe of lower lip broad, recurved; stamens and style much exserted; filaments pubescent or subglabrous; nutlets to 3 mm long, globose, dark brown, diffusely patent-hairy, prominently netted-rugose. April–July (up to September).

Meadows, scrub, forests, small woods, river valleys. — European part: Balt., Lad.-Ilm., U.V., U. Dnp., V.-Kama, M. Dnp., V.-Don, Transv., U. Dns., Bes., Bl., Crim., L. Don; Caucasus: universal. **Gen. distr.:** Europe, except for the Arctic, Med., Bal.-As. Min., Arm.-Kurd. Described from Switzerland. Type in London.

Note. This species is remarkable for its variability and heterogeneity within its distribution area (see synonymy). Further studies are required to determine the extent of seasonal variability of its individuals and the ecological adaptations of the various forms. Greatest variability is to be found in size of radical leaves and bracts, vesture of the stem, and color of corolla. In the typical form, the stem is hairy all round, often villous, the radical leaves exceed the lower stem leaves, and the bracts are about as long as the flowers. 36 Other known forms are: (1) var. *excelsa* Lindem. *Florula Elisabethgr.* (1868) 120 (*A. foliosa* Tratt.), with higher stems (to 40–50 cm) and coarsely toothed leaves which are 2–3 times as long as in the typical form; the lower 2–6 pairs of bracts are also large and greatly exceed the flowers; mostly in forests, forest margins and coppices; (2) var. *elatio* (Fries) Briq. in Hegi, III; *Fl. V.*, 2544; *Syreishch. Fl. Mosk. gub.* III, 115; *Fl. Yugovost.* VI, 134, close to the type, characterized by small radical leaves (the size of lower stem leaves), acutely 3-lobed lower and middle bracts that exceed the flowers and diffuse pubescence of the stem; (3) var. *serotina* Kosh. et Zing. *Fl. Tul'sk. gub.* (1880) 91, a late-flowering form (end of July–August), with very large, long-petioled radical and lower stem leaves.

Forms representing color variations occur throughout the region: *f. roseiflora* Choroschk. (in *Tr. Bot. sada Yur'evsk. univ.* VIII, 1908, 17) and *f. albiflora* Syreisch. (*Fl. Mosk. gub.* III, 1910, 115).

There are records of hybrids *A. genevensis* L. × *A. reptans* L., in varying degree resembling one or the other parent species: × *A. genevensis* var. *stolonifera* Zing. (in *Byull. Mosk. obshch. ispyt. prir.* 1881, No. 2, 329), with short stolons, and × *A. hybrida* Kern. (in *Oesterr. Bot. Zeitschr.* XXIV, 1874, 382), similar to *A. reptans* but non-stoloniferous, with dentate radical leaves persistent in flowering.

12. ***A. multiflora*** Bge. *Enum. pl. Chin. bor.* (1831) 51; *Kom. Fl. Man'chzh.* III, 334; *Kom. and Alis. Opred. rast. Dal'nevost. kraya*, II, 892. — *A. genevensis* auct.: Maxim. *Prim. fl. Amur.* (1859) 221 et in *Mél. Biol.* (1883) 815; *Korzh. in Tr. Bot. sada*, XII, 380, non L.; *Forb. et Hemsl. Ind. Fl. Sin.* II, 315, p. p. — *A. amurica* Freyn in *Oesterr. Bot. Zeitschr.* (1902) 408. — **lc.:** *Kom. and Alis., op. cit.* 892, Plate 20.

Perennial, non-stoloniferous, with a short main root and bundles of large lateral roots; stems erect, robust, solitary or 2–3 developing from one root, simple, 8–25 cm long, white-villous with long articulate hairs; radical leaves with petiole to 6 cm, oblong or oblong-elliptic, 5–10 (12) cm long, 2–3 (4) cm wide, obtuse, entire or obscurely incised, glabrous or with remote short hairs; cauline leaves sessile, broadly lanceolate or acuminate-ovate, 2–4 cm long, 1–3 cm wide, obscurely dentate-crenate in upper half, appressed-lanate (especially at base), longer than the internodes, gradually smaller toward summit; upper

- 37 bracts white-villous, ovate or oblong-ovate, entire or sparsely toothed at apex, longer or (more often) shorter than the flowers; flowers subsessile, crowded in verticels of 8-10, bright blue; calyx 5-6 mm long, densely long-hairy, the 5 equal narrow, triangular-pointed teeth longer than the tube; corolla soft-hairy outside, 12-15 mm long, the tube twice as long as the calyx; lower lip large, 8-9 mm long, the obcordate middle lobe to 7 mm wide; upper lip faintly 2-lobed; stamens and style exserted; filaments pubescent; nutlets 2.5-3.5 mm long, pale brown, prominently netted-rugose, with short scattered hairs. April-June.

Meadows, meadow slopes, clearings, scrub. East Siberia: Dau.; Far East: Ze.-Bu., Uss.

Gen. distr.: China (Manchuria). Vicariate races in S. China and Japan. Described from near Peking. Type in Paris.

13. *A. pyramidalis* L. Sp. pl. (1753) 561; Benth. Lab. gen. et sp. 693; in DC. Prodr. XII, 596; Ldb. Fl. Ross. III, 447, p. p. (quoad pl. Ross. septentrion.); Shmal'g. Fl. II, 345; Fedch. and Fl. Fl. Evrop. Ross. III, 800. — *A. nana* Gilib. Pl. rar. et comm. Lithuan. (1785) 17 et Fl. Lithuan. in Delect. Opusc. Bot. II (1793) 323. — *A. alpina* Sut. Fl. Helv. II (1802) 2 and II (1822) 2, non L. nec Vill. (?). — *A. vulgaris* ssp. *pyramidalis* Rouy, Consp. Fl. Franc. (1927) 206. — *Bugula pyramidalis* Crantz, Inst. I (1766) 518. — *Teucrium pyramidale* Crantz, Stirp. Austr. ed. II (1769) 252. — **lc.:** Fl. Dan. (1765), tab. 185; Rchb. Ic. Fl. Germ. XVIII, tab. 1234.

Perennial, non-stoloniferous, with short main root and a bundle of strong lateral roots; stems simple, erect, 10-30 cm long, villous all round with stiff, patent hairs, rarely glabrate below; leaves in radical rosette numerous, short-petioled, large, obovate or broadly spatulate, entire or crenulate at apex, rough with articulate hairs; bracts broadly ovate, the terminal oblong-ovate, entire, rarely obscurely toothed, sessile, often violet, always exceeding the flowers; verticillasters mostly 6-flowered, borne from base of stem and forming a dense, 4-angled inflorescence; flowers small, 10-13 mm long, sessile, pale blue; calyx subglabrous below, about half as long as corolla-tube, the teeth nearly as long as the tube; corolla villous, the upper lip 2-lobed, the lower lip with small middle lobe; filaments and style slightly exceeding the lobes of upper lip; nutlets globose, ca. 1.5 mm long, distinctly netted-rugose, with scattered patent hairs. May-June.

- 38 Meadows in northern regions. — European part: Balt., Kar.-Lap. **Gen. distr.:** Scand., Centr. and Atl. Eur., W. Med. (mountains), Bal.-As. Min. (Balkans). Plant of northern meadows or Alps. Described from Sweden. Type in London.

Note. A typical, arctic-alpine species erroneously reported from many parts of the middle belt and the Caucasus; in lowlands apparently confused with some forms of *A. genevensis* (e.g. with its fall forms) and in the Caucasus mostly with *A. orientalis*. Hybrids of *A. genevensis* L. \times *A. pyramidalis* and *A. pyramidalis* \times *A. reptans* occur in regions where the parent species grow together (mainly in mountains).

Subsection 2. *Orientales* Maxim. in Mél. biol. XI (1883) 824 (pro serie). — Corolla-tube contorted; stamens and style included in corolla-tube.

14. *A. orientalis* L. Sp. pl. (1753) 561; Benth. Lab. gen. et sp. 693; in DC. Prodr. XII, 596; M. B. Fl. taur.-cauc. II, 32; Ldb. Fl. Ross. III, 447; Boiss. Fl. or. IV, 800; C.

Koch in Linnaea, XVII, 301 et in Linnaea, XXI, 702; Shmal'g. Fl. II, 344; N. Pop. in Mat. Fl. Kavk. IV, 3, 30. — *Bugula obliqua* Moench, Meth. (1794) 382. — *B. orientalis* Mill. Gard. Dict. ed. VIII, No. 5. — **lc.**: Kniphof, Herb. Viv. I tab. 21; Fiori et Paol. Ic. Fl. Ital. 362.

Perennial, with slightly oblique creeping rhizome; stems erect or slightly ascending, simple, 10–20 (30) cm long, like the leaves white- or yellowish-lanate-villous, sometimes glabrescent in lower part; radical leaves persistent in flowering, oblong-elliptic or broadly ovate, tapering to petiole, dentate-crenate or crenate, sometimes with large apical teeth; bracts usually sessile, elliptic, broadly elliptic or obovate, amplexicaul, often rugose, large-toothed or 3–5-fid, longer than, equal to or shorter than flowers (var. *condensata* Boiss.), the terminal ones often violet (var. *aenesia* Heldr.); verticillasters many-flowered, more or less remote below, crowded above in compact spikelike inflorescence, sometimes (var. *condensata* Boiss.) crowded from base of stem; flowers subsessile; calyx 5–6 mm long, campanulate, lanate-villous (sometimes glabrate at base), the teeth narrow, acute, profusely hairy, more than twice as long as the tube; corolla 13–16 (18) mm long, with blue limb (often faded in herbarium); tube almost white, glabrous, contorted so that the lower lip assumes dorsal position; upper lip with 2 large ovate lobes, lower lip with small slightly emarginate middle lobe and closely adjacent lateral lobes; limb of corolla sparingly lanate-villous outside, the tube slightly exceeding the calyx; nutlets globose-ovoid, ca. 2 mm long, reticulate-rugose, sometimes with scattered hairs. April–June.

Exposed stony slopes of dry hills, extending to subalpine and alpine belt, in meadows, clearings and scrub. — European part: Bes., Crim.; Caucasus: Cisc., Dag., W., E. and S. Transc. **Gen. distr.**: Med., Bal.-As. Min., Arm.-Kurd., Iran. Described from Southwest Asia. Type in London.

Genus 1241.* **Teucrium**** L.

L. Sp. pl. (1753) 562. — *Scorodonia* Adans. Fam. II (1763) 188. — *Scordium* Gilib. Fl. Lithuan. I (1781) 95. — *Chamaedrys* S. F. Gray, Nat. Arr. Brit. pl. II (1821) 369. — *Monochilon* Dulac, Fl. Hautes-Pyrén. (1867) 405. — *Botrys* Fourr. in Ann. Soc. Linn. Lyon, n. s. XVII (1869) 138.

Flowers distinctly pediceled, sometimes sessile, in 1–3 (10)-flowered cymose inflorescences, borne in the axils of undifferentiated or slightly differentiated bracts, and forming a terminal inflorescence, this mostly secund, racemiform or spiciform, rarely capitate or umbellate; calyx tubular or campanulate, often curved, 10-nerved, with 5 subequal triangular teeth or with an enlarged upper tooth and thus 2-lipped; corolla mostly deciduous, the tube short, included, rarely slightly exserted, without a ring of hairs inside, often hairy outside; upper lip seemingly absent, being cleft in two with the two halves shifted to the lower lip which thus appears 5-lobed; middle lobe large, rounded or oblong, entire or finely toothed, mostly concave, generally recurved; lateral lobes smaller, oblong, often also recurved or straight, divaricate; stamens 4, ascending, often long-exserted, didynamous,

* Treatment by S. V. Yuzepchuk.

** From the Greek *teukrion*, name given by Theophrastus and Dioscorides to certain species of this genus; from the legendary Teucer (Greek Teukros, Latin Teucus or Teucer), credited with discovery of the plant's healing properties.

the small divergent anther-cells confluent at apex; style with 2 short subequal branches; nutlets obovoid, tapering at base, reticulate or rugose. Perennial, very rarely annual herbs, subshrubs or shrubs, often with an aromatic, rarely disagreeable, odor. Leaves usually short-petioled, entire, crenate-dentate or pinnatilobate or parted.

A genus of cosmopolitan distribution, but characteristically Mediterranean. It comprises ten well differentiated sections.

- 40 1. Verticillasters forming racemiform or spiciform inflorescences; flowers reddish, purple or blue (white only in albinos) 2.
+ Flowers crowded in dense umbellate or capitate inflorescences, whitish or yellowish 18.
2. Leaves deeply pinnatipartite 3.
+ Leaves entire, crenate-dentate or rather deeply incised-crenate (nearly lobate). . . 6.
3. Perennials, with eglandulose hairs 4.
+ Glandular-hairy annuals 7. *T. botrys* L.
4. Stamens long-exserted 5.
+ Stamens not exserted 3. *T. parviflorum* Schreb.
5. Plant covered with short, rarely rather long, patent hairs 1. *T. orientale* L.
+ Plant appressed-tomentose 2. *T. taylori* Boiss.
6. Upper teeth of calyx broader than the lower pair (calyx 2-lipped); bracts linear-subulate; inflorescence narrowly cylindric, spicate 4. *T. hircanicum* L.
+ Upper teeth of calyx broader than the lower pair; bracts lanceolate; inflorescence compound, rather broad, racemose 4a. *T. ussuriense* Kom. (page 364).
++ Calyx-teeth subequal 7.
7. Stems herbaceous; all flowers shorter than bracts (plant smelling of garlic). . . 8.
+ Stems more or less woody at base; all flowers, or at least the upper, longer than the bracts or scarcely shorter (aromatic plants) 9.
8. Leaves 2-3 times as long as broad, not or slightly cordate at base, acutely crenate-dentate, short-hairy 5. *T. scordium* L.
+ Leaves to twice as long as broad, cordate at base, obtusely crenate, tomentose-lanate 6. *T. scordioides* Schreb.
9. Plants non-stoloniferous; stems and lower side of leaves canescent with very short tomentum 17. *T. canum* Fisch. et Mey.
+ Plants often stoloniferous; stems and lower side of leaves with patent hairs . . 10.
10. Inflorescence of moderate length or abbreviated; verticillasters more or less approximate; bracts gradually smaller toward summit, usually all more or less toothed, the upper concave 11.
41 + Inflorescence markedly elongated; verticillasters very distant; bracts abruptly diminishing in size, at least the upper entire, all flat 16.
11. Calyx-teeth with long, commonly sparse hairs on margins, short hairs wanting or few 12.
+ Calyx-teeth covered with very thick short hairs, interspersed with long ones on margins 14.
12. Leaves with comparatively narrow cuneate base, not very densely hairy beneath. 8. *T. nuchense* C. Koch.

- + At least lower leaves not narrowly cuneate, all leaves rather densely hairy beneath, often nearly velutinous 13.
- 13. Calyx-teeth narrow, long, acuminate; lower leaves cordate or truncate at base 9. **T. multinodum** (Bordz.) Juz.
- + Calyx-teeth short and broad, acute; lower leaves with broadly cuneate or notched base 10. **T. trapezunticum** (Reching. fil.) Juz.
- 14. Leaves finely crenate-dentate, densely pubescent beneath, nearly velutinous; flowers pale purple 13. **T. fischeri** Juz.
- + Leaves largely and irregularly crenate-dentate, not very densely hairy beneath, not velutinous; flowers darker 15.
- 15. Inflorescence shorter than the leafy part of stem; bracts often green, rarely colored; flowers of medium size, purple 11. **T. chamaedrys** L.
- + Inflorescence nearly as long as the leafy part of stem; bracts nearly black-purple; flowers larger, very dark purple 12. **T. pulchrius** Juz.
- 16. Leaves finely and obtusely dentate; most bracts entire 17.
- + Leaves largely and acutely dentate; only uppermost bracts entire 16. **T. excelsum** Juz.
- 17. Stems densely covered with long patent hairs; leaves densely velutinous-hairy beneath; upper bracts entire, oblong-ovate; corolla very dark purple 15. **T. krymense** Juz.
- + Stems with comparatively short hairs; leaves not velutinous beneath; upper bracts entire lanceolate; flowers purple 14. **T. sypsiense** C. Koch.
- 18. Flowers rather large, 1–1.5 cm long; all leaves entire 19.
- 42 + Flowers small, 5–8 mm long; leaves crenate-dentate 21. **T. polium** L.
- 19. Stems appressed-tomentose 20.
- + Stems patent-hairy 20. **T. pannonicum** Kern.
- 20. Leaves densely tomentose, gray-green above; calyx densely or very densely tomentose outside, the teeth not ciliate or obscurely ciliate along margin 18. **T. jailae** Juz.
- + Leaves dark green, with short scattered hairs above; calyx with appressed short hairs outside, the teeth sparsely short-ciliate along margin 19. **T. praemontanum** Klok.

Section 1. **Teucris** Benth. Lab. gen. et sp. (1835) 661. — Shrubs or (in USSR) subshrubs, with opposite, axillary, 1–3-flowered cymes forming a racemose or paniculate inflorescence; calyx campanulate, erect, with 5 subequal teeth; leaves in our species (subsection *Incisae* Briq.) deeply parted.

Series 1. *Orientalia* Juz. — Subshrubs with pinnatisect leaves. Flower in loose paniculate inflorescence; filaments long-exserted.

1. **T. orientale** L. Sp. pl. (1753) 562; Ldb. Fl. Ross. III, 1, 442; Shmal'g. Fl. II, 347; N. Pop. in Mat. Fl. Kavk. IV, 3, 64. — Ic.: Bot. Mag. XXXI, tab. 1279. — Exs.: GRF, No. 1129; Fl. cauc. exs. No. 167.

Perennial, with woody, strongly branching root; rhizome short, branching, usually woody; stems few or many, 10–50 cm long, slightly ascending at base or erect, straight or flexuous, distinctly 4-angled, rather densely clothed with short, rarely (especially in inflorescence) long hairs, sometimes thickly covered all over with long multicellular slightly crisp hairs; branches opposite; leaves rather distant, 1–3 cm long, 1.2–4 cm wide, broadly rhombic, broadly ovate or suborbicular, deeply thrice pinnatisect, the lobes rather long, narrowly linear, slightly revolute, green or canescent, with short patent or appressed hairs above, rather densely covered beneath with short hairs, mainly along prominent nerves, sometimes both sides rather densely covered with stiff crisp hairs; petioles 0.1–1 cm long; inflorescence lax, paniculate or paniculate-corymbiform, its branches usually more or less elongate, often with short secondary branches; peduncles 1–3-flowered, longer than the small dissected bract and the calyx; calyx 3–5 mm long, short-campanulate, with both short and long scattered hairs, the teeth spreading, triangular or lanceolate, acute, carinate, often subglabrous, nearly as long as the tube or slightly shorter; corolla 1–1.7 cm long, 3–4 times as long as the calyx, blue, the middle lobe elongate, concave, acute, short-hairy beneath, the upper 4 lobes ovate or lanceolate, acute; filaments to 1.7 cm long, long-exserted, with short crisp hairs below; nutlets glabrous, rugose, with bloom of small, pellucid, granular glands. June–August. (Plate III, Figures 1 and 2.)

Gravelly-stony or clayey mountain slopes with xerophytic vegetation, mountain pine forests, mountain meadows and alpine pasturelands, clayey and stony banks of rivers, sandy hills. — Caucasus: Cisc., Dag., E. and S. Transc. **Gen. distr.:** Bal.-As. Min., Iran. Described from the “East” (probably from Armenia).

Note. Forms with stems and leaves covered with thick and long, spreading hairs resemble *T. orientale* β *villosum* Benth. (in DC. Prodr. XII, 1848, 577). They are very rare in the USSR, where they occur mainly in Southern Transcaucasia; they have also been found in other areas (Dagestan and even Ciscaucasia), but are more widespread in Asia Minor and Iran. Even there they grow alongside the typical *T. orientale*; thus they have no separate distribution area and are not otherwise sufficiently distinct from the typical form (c.f. similar forms in: Čelakovsky, Ueber einige Arten der Gattung *Teucrium*, Bot. Centralbl. XIV, 1883, 223).

Economic importance. Occasionally cultivated as an ornamental.

2. *T. taylori* Boiss. Diagn. Ser. I, 7 (1846) 61; id. in Fl. or. IV, 809; Grossg. Opred. rast. Kavk. 325 — *T. pruinatum* Grossh. Fl. Kavk. III (1932) 282, non Boiss.

Perennial, rhizomatous, caespitose, densely gray-tomentose with very short appressed hairs (vesture resembling that of the preceding species); stems many, 8–30 cm long, erect from ascending base, shortly paniculate-branched in upper part; leaves 0.6–3 cm long and as wide, rounded-ovate or orbicular, gray on both sides, bipinnatisect nearly to base, the segments entire, very short, linear, obtuse, revolute-margined, prominently veined beneath; peduncles loosely branching, 1–3-flowered; pedicels 2–3 times as long as calyx and bracts, the latter grayish like the pedicels; calyx 4–5 mm long, short-campanulate, 5-partite to middle, the teeth long-subulate from triangular base; corolla ca. 1 cm long, twice as long as calyx, blue; middle lobe mitriform, obtuse, short-hairy beneath; filaments long-exserted as in *T. orientale* but (at least in forms with normal vesture) in lower half more densely hairy and glandular than in the (otherwise similar) preceding species. June.

Stony places and slopes. — Caucasus: S. Transc. (near Erevan). **Gen. distr.:** Iran. Described from the foot of "Sabst-Buschom" mountain near Shiraz. Type in Geneva.

Notes. 1) We have not seen the type of *T. taylori* Boiss. or any other authenticated material; the identification of the Erevan plant with this species is Grossgeim's. Some features of this plant, in particular the character of the vesture and the narrow teeth of the calyx, also occur in the next species. The plant is possibly of hybrid origin.

2) In addition to *T. orientale* L. and *T. taylori* Boiss. the series *Orientalia* contains a wide array of distinct races, all of which, however, are to be found outside the USSR (Southwest Asia). One of them is the Iranian *T. pruinatum* Boiss., erroneously reported by Grossgeim for Armenia; it was confused with *T. taylori* Boiss. although it differs markedly from that species in habit and vesture.

Series 2. *Parviflora* Juz. — Like the preceding series, but filaments scarcely exerted from corolla.

3. ***T. parviflorum*** Schreb. Pl. Vert. Unilab. gen. et sp. (1774) 31; Boiss. Fl. or. IV, 810; N. Pop. Mat. for Fl. Kavk. IV, 3, 69; Grossg. Fl. Kavk. III, 282. — **lc.:** Schreb. l. c. tab. p. XXXI, No. 18.

Perennial, rhizomatous; stems many, erect, herbaceous, 0.4–1 m long, stout, obtusely 4-angled, divaricately long-branched from middle upward, the entire plant, including calyces, gray with dense, very fine and rather slender, slightly crisp hairs; leaves somewhat distant, 3 to 6 cm long, 2–8 cm wide, broadly ovate or (the upper) lanceolate from cordate base, 3-partite nearly to base, the lobes pinnatisect into 2–4 pairs of segments, these narrowly linear, entire, divergent, slightly revolute-margined, mucronate, with a prominent midrib beneath, leaves on side-shoots also 3-partite but the middle lobe 3-sect, the lateral lobes entire; inflorescence broadly and shortly pyramidal-paniculate; bracts small, 3-partite into linear lobules; peduncles 1-flowered, remote or spreading, filiform, as long as or longer than the bracts, nearly half as long as the calyx; flowers small; calyx 5–7 mm long, campanulate, ribbed, like pedicels short-tomentose, the narrowly lanceolate acute teeth nearly as long as tube; corolla 6–8 mm long, barely exceeding to at most half as long again as the calyx, blue, with obtuse lobes, tomentulose outside; filaments short, scarcely exerted; nutlets with short hairs. June.

Dry mountain slopes, arable and weed-infested land. — Caucasus: S. Transc. (Mount Aragats, Kipchak). **Gen. distr.:** Bal.-As. Min., Iran. Described from Armenia. Type possibly in Leipzig.

Note. As regards occurrence in the Russian flora, we are only aware of Radde's old specimens, from the localities indicated. Apart from *T. parviflorum*, the series *Parviflora*, which corresponds to *Micrandrae* Briq., also contains *T. macrum* Boiss. et Hausskn. from S. Iran.

Section 2. ***Stachyobotrys*** Benth. Lab. gen. et sp. (1835) 662. — Perennials; flowers solitary or in irregular verticillasters, forming a simple, more or less one-sided spike; calyx campanulate, 2-lipped, with 3 larger, broadly ovate upper teeth.

(47)



PLATE III. 1 — *Teucrium orientale* L., general aspect, flower, calyx; 2 — *T. orientale* var. *villosum* Benth., part of stem with leaves; 3 — *T. hircanicum* L., summit of stem with inflorescence, flower, calyx; 4 — *T. scordium* L., general aspect, flower, calyx; 5 — *T. scordioides* Schreb., part of stem with leaves.

4. **T. hircanicum** L. Syst. X (1759) 1096; Sp. pl. (1763) 789. — *T. hircanicum* Ldb. Fl. Ross. III, 1, 442; N. Pop. in Mat. Fl. Kavk. IV, 3, 61. — *Scorodonia spicata* Moench, Meth. (1794) 385. — **Ic.:** Bot. Mag. XLV, tab. 2013. — **Exs.:** Herb. Fl. Cauc. No. 345.

Perennial, with short, ascending, woody rhizome; stems 20–70 cm long, herbaceous, few-branched or simple, densely covered with soft, short or rather long, spreading hairs, often reddish, especially below; leaves 2.5–8 cm long, 1–5 cm broad, ovate-oblong, gradually tapering from deeply cordate or truncate base, obtuse, incised-crenate, with many (10–30 on each margin) large obtuse or subacute unequal teeth, rarely bicrenate, green above, with scattered or rather dense hairs above, grayish beneath with very long somewhat crisp hairs, densely hairy on very prominent veins; calyx 0.3–2 cm long, with vestiture as on stems; lateral branches, if present, shortish, ascending; inflorescence showy, dense, spicate, 6–25 cm long, cylindrical; lateral inflorescences, if present, much smaller; bracts markedly
46 ly differentiated from upper cauline leaves, 5–8 mm long, linear-subulate, villous-hairy, equaling or slightly shorter than the calyx, concealed among flowers; pedicels straight, spreading, shorter than the calyx; calyx 3–5 mm long, slightly accrescent, campanulate, drooping, densely patent-villous, 2-lipped, the upper teeth broader than the others, broadly ovate, mucronate, membranous, sparingly pubescent, netted-nerved, the lateral teeth short, nearly semiorbicular, obtuse, the lower teeth ascending, lanceolate, acute; corolla purple, short-villous-hairy outside, half as long again as calyx; filaments long-exserted; nutlets subglobose, ca. 1 mm long, granulate, glandular. June–August. (Plate III, Figure 3.)

Forests, wood margins, coppices, clearings, meadows. — Caucasus: Dag., W. and E. Transc., Tal. **Gen. distr.:** Iran. Described from Girkan province. Type in London.

Economic importance. Sometimes grown as ornamental.

Section 3. **Scordium** Rchb. Fl. germ. exc. (1831) 314; Benth. Lab. gen. et sp. 662. — Perennials, with remote, 2–6-flowered, axillary verticillasters; calyx with oblique, gibbous base, with subequal teeth.

Series 1. *Scordia* Juz. — Eglandular perennials, with entire leaves.

5. **T. scordium** L. Sp. pl. (1753) 565; Ldb. Fl. Ross. III, 1, 443; Shmal'g. Fl. II, 347; N. Pop. in Mat. Fl. Kavk. IV, 3, 59; Kryl. Fl. Zap. Sib. IX, 2293. — *T. palustre* Lam. Fl. Fr. II (1795) 411. — *T. arenarium* S. G. Gmel. Reise, I (1770) 149. — *T. scordium* ssp. *palustre* Gams in Hegi, III. Fl. V, 4 (1927) 2531. — *T. scordium* var. *borysthenticum* Schost. in Bot. mat. gerb. Bot. inst. AN SSSR, VIII, 9 (1940) 148. — *Chamaedrys scordium* Moench, Meth. (1794) 384. — **Ic.:** Gmel. l. c. tab. XXVI (*T. arenarium* Gmel.); Rchb. Ic. Fl. Germ. XVIII (1856) tab. 38, fig. II, 2–4. — **Exs.:** Fl. pol. exs. No. 226; Eesti Taimed, No. 83, 83-a.

Perennial, with creeping rhizome and freely rooting stolons; stems ascending, then erect, 10–25 (40) cm long, simple or branching, subterete, softly villous-hairy all over,
49 often — like leaves — violet-tinged; leaves closely approximate, 15–30 (50) mm long,

4-12 (20) mm wide, thin, oblong-elliptic, 2-3 times as long as broad, only the lower slightly cordate or rounded at base, these on branches tapering to sessile base, crenate with 4-6 large acutish teeth on each margin, pinnately nerved with short appressed hairs above and spreading hairs beneath, especially on veins, otherwise glabrate or with short spreading hairs; middle leaves largest; bracts only slightly smaller than leaves, much longer than the flowers; inflorescence slender; verticillasters about half as long as the bracts, usually 2-5-flowered; flowers 6-10 mm long, short-pedicel; calyx tubular-campanulate, gibbous at base, glandular-villous, green or more or less violet-tinged, the teeth lanceolate, acute, half as long to nearly as long as the tube; corolla twice as long as the calyx, pale crimson-red, rarely white, the lower lip sparingly pubescent beneath, the rounded middle lobe and the lateral lobes recurved; stamens slightly exserted; nutlets ca. 1 mm long, reticulate-pitted. Plant smelling of garlic. July-August. (Plate III, Figure 4.)

Damp meadows, ditches, banks of rivers and lakes (especially sandy banks). — European part: Balt., V.-Kama, U. Dnp., M. Dnp., V.-Don, Transv., Bl., L. Don, L.V.; West Siberia: U. Tob., Irt.; Centr. Asia: Ar.-Casp. **Gen. distr.:** Scand., Centr. and Atl. Eur., Med. (Spain, Italy). Described from W. Europe. Type in London.

Note. This species is not sharply differentiated from the next. Transitional forms occur where the distribution areas overlap, e.g. with leaf base and serration as in *T. scordium* but vestiture excessive for this species, or, conversely, with the vestiture of *T. scordium* but exceptionally obtuse-crenate leaves, etc. The variety established by Shostenko apparently represents one of these transitional forms.

Close study of some of the southern Russian forms of *T. scordium* (in particular the Don and S. Kazakhstan specimens) may lead to their separation from the genuine *T. scordium*; they seem to represent a poorly differentiated race gravitating toward *T. scordioides* (stems more strongly branching, leaves with more obtuse teeth, vestiture slightly more profuse, flowers smaller) that may qualify for the name *T. arenarium* S.G. Gmel.

Economic importance. The plant contains essential oils, bitter principles and tannin, and has long been known for its medicinal properties and was highly valued in antiquity. It has been used as antiseptic, tonic and anthelmintic, for treatment of bubonic plague, lung diseases, etc.

6. *T. scordioides* Schreb. Fl. Vert. Unilab. (1774) 37; Ldb. Fl. Ross. III, I, 444; Shmal'g. Fl. II, 347; N. Pop. in Mat. Fl. Kavk. IV, 3, 60. — *T. scordium* var. *scordioides* Arcang. Fl. Ital. (1882) 559. — *T. scordium* subsp. *scordioides* Rouy, Fl. Fr. XI (1909) 237. — *T. lanuginosum* Hoffmgg. et Link, Fl. Portug. I (1809) 80. — **Ic.:** Rchb. Ic. Fl. Germ. XVIII, tab. 38, fig. III; Hoffmgg. et Link, l. c. tab. 1. — **Exs.:** Orph. Fl. Graec. No. 540.

Perennial, with creeping rhizome and rooting stolons; stems usually erect, 12-60 cm long, mostly profusely branching, 4-angled, uninterruptedly, densely and softly lanate-tomentose; leaves closely approximate, 0.5-4.5 cm long, 0.25-2.5 cm wide, oblong-ovate or short-elliptic, usually not more than twice as long as broad, rounded at base (especially on side-shoots) or mostly cordate, semiamplexicaul, sessile, obtusely crenate, with 3-12 large crenations on each margin, thin, more or less densely tomentose-villous on both sides with rather long hairs; bracts usually not more than twice the length of flowers; main inflorescence long and slender; axillary inflorescences up to half the length of the

bracts, 2-5-flowered; flowers 5-8 mm long; pedicels rather long, especially in fruit; calyx campanulate, gibbous at base, densely tomentose-villous, usually green, the teeth lanceolate, acute, half as long as the tube; corolla twice as long as the calyx, purple, sometimes white, with slightly exerted stamens. In all other respects similar to *T. scordium* L. July—September. (Plate III, Figure 5.)

Wet, sometimes solonchets meadows, marshes, sandy and stony banks of rivers, brooks and lakes, fluvial plains, seacoasts, rarely steppes or mountain slopes. — European part: Bes., Crim.; Caucasus: universal (becoming rare in S. Transc.); Centr. Asia: Balkh., Mtn. Turkm., Syr D., Pam.-Al., T. Sh. **Gen. distr.:** Atl. Eur., Med., Bal.-As. Min., Iran. Described from Crete.

Economic importance. Presumably as in preceding species; according to Grossheim, used as a condiment in the Caucasus.

Series 2. *Botrys* Juz. — Annuals, with strongly developed glandular vesture and pin-natipartite leaves.

7. *T. botrys* L. Sp. pl. (1753) 562; Ldb. Fl. Ross. III, I, 444; Shmal'g. Fl. II, 348; Klok. in Vozn. rosl. 408. — *Chamaedrys botrys* Moench, Meth. (1794) 383. — *Scorodonia botrys* Ser. Bull. Bot. (1830) 317. — *Botrys chamaedryoides* Fourr. in Ann.
51 Soc. Linn. Lyon. 17 (1869) 138. — Ic.: Rchb. Ic. Fl. Germ. XVIII, tab. 38, fig. II, 1; Hegi, III. Fl. V, 4, fig. 3368.

Annual, rarely perennial, with oblique, frequently curved root; stems mostly much branched from low down, rarely simple; branches (5) 10-39 (40) cm long, arcuately ascending or straight at base, then declined or nearly upright, obtusely 4-angled, green or reddish, entire length covered with horizontally spreading short and long glandular hairs interspersed with fewer long simple ones; leaves 1-2.5 cm long and as wide, ovate to broadly ovate, usually deeply 1-2-3-pinnatifid, the lobes short, linear or spatulate, obtuse, 1-nerved, dark green with short scattered hairs above, grayish with sessile and stipitate glands beneath, the veins and margins with recurved hairs; petioles 0.5-1.5 cm, covered with hairs of the same kind as on stems; verticillasters 2-4-flowered, secund, borne in axils of undifferentiated upper leaves, slightly shorter than the latter; flowers 10-15 mm long; pedicels 3-7 mm long, erect, spreading or declined with hairs of the same kind as those on stem and calyx; calyx campanulate, reticulate-nerved, curved, strongly gibbous, densely covered with stipitate glandular hairs, the teeth triangular, erect or slightly converging, the two lower smaller than the rest; corolla purple, the short tube included in calyx, the lower lobe of lip pale, large, concave, sparingly hairy outside, the lateral lobes acute, 3-fid, the upper lobes small, acute; stamens and style long-exserted, curved; nutlets subglobose, 1.5-2 mm long, scabrous-pitted, with deep furrow at areola. The whole plant has a disagreeable odor. July—August.

Dry hills, calcareous rocks, shrubs. — European part: U. Dns. **Gen. distr.:** Atl. and Centr. Eur., Med. Described from W. Europe. Type in London.

Section 4. *Chamaedrys* Schreb. Verticill. gen. (1774) 19; Benth. Lab. gen. et sp. (1835) 662. — Subshrubs, with 2-6-flowered verticillasters forming a loose, rarely compact,

racemose inflorescence; calyx tubular, attenuate at base and slightly gibbous, with 5 lanceolate or triangular subequal teeth.

52 Note. Until recently, *T. canum* Fisch. et Mey. was the only species in this group segregated by Russian botanists from *T. chamaedrys* L., while all other forms were combined under the latter name. They constitute, however, a very complex cycle with many variable forms. K. H. Rechinger (Fil. Bot. Arch. 42, 1941, 335–420) quite aptly refers to this cycle as “confused but very attractive.” The present treatment of the section is far from definitive. We have endeavored to arrange the known forms of the cycle of *T. chamaedrys* s.l. in three series though some of these may crossbreed and produce numerous “transitional” forms, which may obliterate the boundaries between series. This, of course, seriously complicates the observed relationships within the group and the classification of the forms included.

Series 1. *Nuchensia* Juz. — Stems and lower side of leaves covered with simple spreading or recurved hairs (not tomentose). Margins of calyx-teeth with scattered or rather numerous long hairs. Inflorescence often abbreviated; bracts gradually diminishing in size, all more or less dentate, the upper more or less concave, scaphoid. A predominantly Caucasian group.

8. *T. nuchense* C. Koch in Linnaea, XXI (1848) 703; Bornm. in Mitt. Thür. Bot. Ver. N. F. 37, 6. — *T. chamaedrys* Ldb. Fl. Ross. III, I (1849) 444, p. p.; Shmal'g. Fl. II, 348, p. p.; N. Pop. in Mat. Fl. Kavk. IV, 3, 49, p. max. p.; Grossg. Fl. Kavk. III, 284, p. max. p. et auct. plur. Fl. Cauc., non L. — *T. chamaedrys* ssp. *nuchense* Reching. fil. in Bot. Archiv, 42 (1941) 370. — Ic.: Reching. fil. l. c. fig. 6 (p. 371) et tab. I, fig. 10, tab. III, fig. 47.

53 Perennial; plant woody at base only; flowering stems 10–30 (40) cm, with geniculately curved base, mostly stoutish or stout, upright, simple or short-branching above, on 2 or 4 faces diffusely hairy, the hairs somewhat crisp, reclinate, shorter than diameter of stem; leaves 1–2.5 cm long, 0.5–1.4 cm wide, short-elliptic from cuneate base, rounded at apex, 1½–2 times as long as wide, rather evenly crenate or incised-crenate with 5–12 short obtuse teeth, furcately 3–6 (mostly 5)-veined on each side, thickish, green on both sides, covered very sparsely above, more densely beneath, with short patent hairs; petioles to 3 mm long, often scarcely delimited from blade, well developed only in lower leaves, the petiole and base of blade rather sparsely and minutely ciliolate; inflorescence mostly very short, contracted, rarely lax, at ends of stems and branches; bracts cuneate or somewhat rounded at base, entire from base to middle, with ciliate margin, the lowermost longer than flowers, the upper navicular, shortly toothed at apex, the uppermost entire, often distally 2-fid; verticillasters many-flowered, more or less crowded; pedicels often much shorter than calyx; calyx campanulate, sparsely covered on the nerves, rarely all over, with short reclinate hairs, the teeth triangular, scarcely longer than wide, approximately half the length of the tube, short-acuminate, with scattered long stiff cilia along margin, short cilia absent or very sparse; corolla (including lower lobe of lip) to 2 cm long, purple, copiously villous outside. June–August. (Plate IV, Figure 1.)

Bare or grassy dry mountain slopes, rocks, meadows, wood margins, pine forests. — Caucasus: all regions. **Gen. distr.:** Bal.-As. Min. Described from "Nuchi." Type in Berlin.

Note. As observed by Rechinger (l. c. 1941, 372–373), the more or less typical forms of this rather polymorphous member of section *Chamaedrys*, which is very widespread in the Caucasus, grow together with forms gravitating toward *T. chamaedrys* L. It is very likely that the latter represent hybrids of these species. Today, the typical *T. chamaedrys* L. appears to be rare in the Caucasus (see Note to *T. chamaedrys* L. below).

9. ***T. multinodum*** (Bordz.) Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 21. — *T. chamaedrys* var. *multinodum* Bordz. apud N. Pop. in Mat. Fl. Kavk. IV, 3 (1916) 57.

54 Perennial; stems rather few, woody at base, mostly upright or scarcely ascending at base, 15–30 cm long, very stout, robust, straight or slightly flexuous, densely covered with short recurved hairs, frequently dark purple; leaves many, commonly 10–15 pairs, 2.5 cm apart, medium size, 1–2.2 cm long, 0.5–1.7 cm wide, equaling or shorter than the internodes, broadly ovate or the upper ovate, approximately 1½ times as long as broad, the lower subcordate, the middle and upper truncate or broadly cuneate at base, all leaves abruptly cuneate at base, rounded or obtuse at apex, rather evenly and shallowly incised-crenate, very often with double or even treble crenations on each margin reaching 1/5–1/4 of half-blade width; blade rather firm, flat, with scattered or rather dense, long, nearly straight hairs above, denser and shorter recurved hairs beneath, the basal cilia very distinct; lateral veins 4–6 on each side of midrib, usually branching, impressed above, very prominent beneath; petioles very short, to 3 mm long (sometimes leaves subsessile), with vestiture like that of stems; inflorescence 2–9 cm long, dense, sometimes subcapitate, with only lower nodes frequently remote, the internodes to 1 cm long; axis of inflorescence with hairs like those on stem but denser; lowermost bracts undifferentiated, the others more or less concave, elliptic, acute, with entire convex margins in lower half, finely and obtusely toothed in upper half, very short-petioled or sessile; verticillasters 2–6-flowered; flowers 1–1.5 cm long; pedicels to half the length of the calyx; calyx campanulate, rounded at base, more or less purple-violet, covered with longish, stiff, patent or reclinate hairs, the teeth slightly spreading, broadly short-triangular, mucronate, very sparingly hairy, with a few longish cilia on the margin, corolla probably pale, with dark purple lower lip. June–July.

Grassy habitats, coppices and forest margins in lower mountain zone. — Caucasus: W. Transc. Endemic. Described from Akhali-Afoni. Type in Leningrad.

Note. The typical form is known only from Abkhazia; specimens from the more northern locations are markedly anomalous, with less hairy leaves, strongly branching stems and very loose inflorescences (*T. circassicum* Juz. ined.). Toward the south *T. multinodum* seems to vicariate with the next species.

10. ***T. trapezunticum*** (Rechinger, fil.) Juz. comb. nova. — *T. chamaedrys* ssp. *trapezunticum* Rechinger, fil. in Bot. Arch. 42 (1941) 369. — **Ic.:** Rechinger, fil. l. c. tab. I, fig. 9 et tab. 3, fig. 46.

Perennial, similar to *T. multinodum* (Bordz.) Juz. but stems with denser, softer and longer hairs; leaves broadly notched-cuneate at base, ovate-spatulate, ca. 2 cm long, 1.2–1.5 cm wide, incised-crenate or nearly lobate with incisions 1/3 of half-blade width,

55 apically more or less short-crenate or incised, diffusely covered with long semi-appressed hairs above, almost tomentose beneath; petioles short, frequently obsolescent; calyx with dense, long, spreading hairs, the teeth short and broad, approximately 1½ times as long as wide, long-acuminate, with long scattered marginal cilia; otherwise like *T. multinodum*. June—July.

Exposed stony and rocky sites. — Caucasus: W. Transc. (Adzhar). **Gen. distr.:** Bal.-As. Min. (NE Anatolia, Trebizond). Described from vicinity of Trebizond. Type in Vienna.

Note. We did not see the type of this inadequately investigated form but, judging by the author's description, we have tentatively included in it a specimen collected by Litvinov somewhere between Adzharis-Tskali and Keda in Adzhar. This specimen is easily distinguishable from all *T. multinodum* (Bordz.) Juz. plants we have seen by the somewhat different vesture of stems and leaves and the characteristic leaf base. However, both species are closely related to *T. nuchense*, and may merely represent local races.

Series 2. *Eu-chamaedrys* Juz. — Like the preceding series but the teeth of the leaves with both long and short dense marginal hairs. Inflorescence longer and looser; bracts narrower, more or less concave, only the uppermost sometimes entire. A predominantly European group.

11. *T. chamaedrys* L. Sp. pl. (1753) 565, s. str.; Ldb. Fl. Ross. I, 1, 444, p. p.; Shmal'g. Fl. II, 348, p. p. — *T. chamaedrys* ssp. *eu-chamaedrys* Reching. fil. in Bot. Arch. 42 (1941) 344. — *T. chamaedrys* β. *lucidum* Čelak. Bot. Centralbl. 14 (1883) 220. — *T. chamaedrys* var. *glanduliferum* Hausskn. in Mitt. Thür. Bot. Ver. N. F. II (1897) 181. — ? *T. pseudochamaedrys* Wender in Flora, IX, 1 (1826) 358. — *T. officinale* Lam. Fl. Fr. II (1779) 414, p. p. — *Chamaedrys officinalis* Moench, Meth. (1794) 383, p. p. — **lc.:** Reching. fil. l. c. tab. I, fig. 1–4. — **Exs.:** GRF, No. 1493.

56 Perennial, with woody base; flowering stems 10–45 cm long, slender to fairly stout, ascending at base or upright, usually curved or flexuous, rarely almost straight, simple or commonly slightly branching, covered on two or all four faces with short, sparse, soft, recurved hairs, pale green or reddish; leaves rather many, more or less remote, 0.7–4 cm long, 0.5–2.5 cm wide, usually ovate, rarely elliptic or oblong, 1½–2½ times as long as broad, cuneately tapering from broadened base, gradually passing into petiole from which they are hardly differentiated (only the lowermost well delimited from petiole), rounded or acutish at apex, largely crenate-dentate or with broad rounded or pointed lobes, entire or more or less crenate or incised; teeth or lobes 4–9 on each margin; lateral veins 4–5 on each side of midrib, scarcely impressed above, scarcely protruding beneath, mostly rather thin, softly herbaceous in live state, mostly chartaceous when dry, bright green above, just a shade paler (but not glaucous) beneath; hairs on upper surface scattered, appressed, on lower surface more profuse or else confined to veins, curved and mostly pointing downward or sideways, the base of blade and petiole with mostly shortish cilia; petioles 1–7 mm long; inflorescence short or elongate but usually much less than half the length of stem; bracts fairly large, nearly always exceeding the calyx, more or less concave (especially the upper), entire at cuneate base (lower third and more), otherwise crenate-dentate, generally green, rarely the upper lilac-tinged; verticillasters 2–5-flowered, usually somewhat distant;

pedicels shorter than or sometimes equaling the calyx; flowers large, purple; calyx 5–6 mm long, rather broadly campanulate, the short, usually curved hairs scattered or confined to nerves, the triangular short-acuminate teeth to 1½ times as long as broad, very densely beset along the margin with short cilia and short-stipitate glands forming a kind of fringe in addition to scattered or fairly dense long cilia; corolla (including lower lip) 1–1.3 cm long; nutlets ca. 1.5 mm long, broadly ellipsoid, brown, smooth or scarcely rugose. June–August. (Plate IV, Figure 2.)

Steppes and steppe slopes, deciduous and pine forests, forest margins, coppices, rocks and outcrops, stony mountain slopes and taluses, sands. — European part: M. Dnp., Bl., L. Don, Bes., U. Dns., Crim.; Caucasus: Cisc., Dag., S. Transc. (also reported for many parts of the Caucasus, but most of these reports clearly refer to *T. nuchense*). **Gen. dist.:** Centr. Eur. (southern part), Med. (Apennines), Bal.-As. Min. (Balkans, Anatolia). Described from Germany, Switzerland, France. Type in London.

Note. A typical feature in the distribution within the USSR of this most eurytopic member of the section is its penetration from the north and south into the Caucasus where it encounters and partly coexists with forms of *T. nuchense* C. Koch. that are very common and unquestionably autochthonous in that region.

- 57 **Economic importance.** The plant contains essential oil, tannin and other substances. It has long been known as a medicinal plant and is still valued in popular practice. The aerial part of the flowering plant is dried and boiled as an infusion. It has been used as excitant, stomachic, tonic, diuretic, antifebrile, antidote, etc. Known in horticulture as a border plant. Tanning agent.

12. ***T. pulchrius*** Juz. in Bot. mat. gerb. Bot. Inst. AN SSSR, XIV (1951) 22. — *T. chamaedrys* auct. Fl. taur. p. p. non L. s. str.

Perennial, 8–20 cm high; stems short, hairy, ascending at base; leaves in relatively few approximate pairs, rather heavily pubescent but bright green, the teeth mostly shallow and broad, simple or double; flowers appearing early so that inflorescence usually accounts for nearly half the overall length of stem; inflorescence frequently branching in lower part, contracted, with very crowded verticillasters, the lower bracts foliaceous, the upper dark lilac, mostly subscaphoid, even the uppermost dentate at apex; flowers very large; calyx ca. 7 mm long; corolla (including lower lip) ca. 16 mm long, dark purple. Otherwise like *T. chamaedrys* L. June–August.

Grassy mountain slopes, meadows. — European part: Crim. Endemic. Described from Avind (Nikitskaya Yaila). Type in Leningrad.

Note. A rather weakly expressed Crimean high-mountain race of the preceding species that appears to be a Crimean analogue of the Balkan *T. olympicum* Reching. fil. (pro subsp. *T. chamaedrys*).

13. ***T. fischeri*** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 23. — *T. tauricum* Fisch. in herb. ex Juz. l. c. — *T. chamaedrys* auct. fl. taur. p. p. non L. s. str. — *T. chamaedrys* var. *hirsutum* Čelak. in Bot. Centralbl. 14 (1883) 220. — *T. chamaedrys* var. *pubescens* N. Pop. in Mat. Fl. Kavk. IV, 3 (1916) 57, p. p. — *T. sypsiense* var. *hirsutum* Reching. fil. in Bot. Arch. 42 (1941) 375, p. p.

Perennial, to 30 cm high; stems slightly ascending at base or nearly upright, covered with thick, horizontally spreading or often distinctly reclinate, rather long white hairs;

58 leaves in many subremote pairs, ovate-oblong, cuneately tapering to petiole, with many fine subequal simple or double obtuse teeth, gray-green with profuse patent hairs on both sides, subvelutinous beneath; inflorescence at most $1/4$ – $1/3$ the overall length of the stem, simple, rarely long-branched in lower part, contracted, mostly with rather crowded verticillasters; bracts gradually smaller toward summit, the lower resembling the stem-leaves, the middle entire laterally, the uppermost often entire throughout, lanceolate, nearly flat or mostly navicular, green, or the upper sometimes dull violet; flower medium size; calyx 4–6 mm long; corolla (including lower lip) 9–12 mm long, pale pink, the lower lip purple. Otherwise like *T. chamaedrys* L. June–August.

Forests (mainly coniferous) and stony mountain slopes. — European part: Crim. (southern shore); Caucasus: W. Transc. (Novorossiisk area). Endemic. Described from Cape Mart'yan. Type in Leningrad.

Note. We have included this plant in the series *Euchamaedrys* principally on account of the navicular upper bracts. In such characters as leaf dentation and vesture, and the often completely entire bracts, it closely resembles some forms of *T. sypsiorensis* affiliation, with which it was apparently confused by Rechinger. It might well be suspected of being a hybrid, possibly a cross between *T. chamaedrys* L. and *T. krymensis* Juz., were it not for some of its particular features, notably the paleness of the corolla, not associated with either of these species.

Series 3. *Sypsiorensia* Juz. — Like the preceding series, but inflorescence markedly elongated; verticillasters very distant; bracts abruptly diminishing in size, all flat, the upper entire. Essentially Anatolian and Iranian groups.

14. *T. sypsiorensis* C. Koch in Linnaea, XXI (1848) 704; Bornm. in Mitt. Thür. Bot. Ver. N. F. 37, 59–60, p. p. — *T. chamaedrys* var. *canum* Boiss. Fl. or. IV (1879) 816, p. p. — *T. chamaedrys* var. *pubescens* N. Pop. in Mat. Fl. Kavk. IV, 3 (1916) 57, p. p. — *T. chamaedrys* ssp. *sypsiorensis* Rechinger. fil. in Ann. Nat. Mus. Wien. 51 (1941) 427; id. in Bot. Arch. 42 (1941) 373. — Ic.: Rechinger. fil. in Bot. Arch. 42, 372, fig. 7; tab. I, fig. 11; tab. 3, fig. 48.

61 Perennial, with woody taproot and woody stem base; stems ascending or upright, 15–25 cm long, slender, flexuous, covered with patent and reclinate hairs, these shorter than diameter of stem; leaves 0.7–1.5 cm long, 0.4–0.8 cm wide, ovate or oblong-ovate, shortly and broadly incised-cuneate at base, rounded or obtuse at apex, $1\frac{1}{2}$ times as long as wide, rather regularly and finely crenate-dentate, with 4–8 entire, rarely cleft teeth on each margin, dark green with sparse appressed hairs above, canescent with hairs beneath; petioles clearly delimited, about $1/3$ as long as the blade, obscurely ciliate; inflorescence often markedly elongated; bracts abruptly diminishing in size, shorter than calyx, cuneate-obovate to lanceolate, acute, dentate only at apex, the upper lanceolate, entire, all flat; verticillasters 4–6-flowered, distant; lower pedicels nearly as long as the calyx, the upper shorter; calyx 5–6 mm long, tubular-campanulate, with short spreading hairs, very often purple-violet; teeth triangular, rather long-acuminate, the margins covered with very profuse short hairs and scattered long bristles; corolla half as long again as the calyx, purple, the middle lobe dark purple. June–July.



PLATE IV. 1 — *Teucrium nuchense* C. Koch, summit of stem with inflorescence, cauline leaf, bract, flower, calyx, calyx-tooth; 2 — *T. chamaedrys* L., leaf, bract, flower, calyx, calyx-tooth; 3 — *T. krymense* Juz., summit of stem and inflorescence, leaf, bract, flower, calyx; 4 — *T. jailae* Juz., general aspect, leaf, bract, flower, calyx; 5 — *T. polium* L., general aspect, leaf, bract, flower.

Dry stony mountain slopes. — Caucasus: W. and S. Transc.? **Gen. distr.:** Bal.-As.Min., Iran. Described from Lesser Armenia (Sber and Ispir). Type in Berlin.

Note. We have interpreted this species in its original and more restricted sense. The very wide scope assigned to it by Bornmüller and Rechinger hardly provides a practical approach. The typical *T. syspirense* C. Koch is unknown in the USSR, but it was collected by Nesterov in Oltyn province and by Turkevich in Artvin province, and may occur in the USSR. For this reason we have included it in "Flora."

15. **T. krymense** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 19. — *T. chamaedrys* var. *pubescens* N. Pop. in Mat. Fl. Kav. IV, 3 (1916) 57, p. p. — *T. chamaedrys* ssp. *syspirense* Reching. fil. in Bot. Arch. 42 (1941) 373, p. p. non *T. syspirense* C. Koch. — *T. syspirense* Zef. Gubotsv. Kryma (1951) 5, non C. Koch.

62 Perennial, woody at base, branching; flowering stems many, ascending or nearly upright, 20–40 cm long, slender or fairly robust, somewhat flexuous, densely covered with soft grayish, slightly declined hairs and nearly vellutinous like the leaves and their petioles; leaves small or medium size, 10–20 mm long, 6–12 mm wide, ovate, approximately twice as long as wide, the lower broadly cuneate at base, the upper more narrowly cuneate, rounded at apex, rather evenly and finely crenate-dentate, with about 7 often double teeth at each side more than 1/3 the width of half the blade, the blade rather firm, flat; lateral veins about 5, often branching, impressed above, slightly protruding beneath but very distinct against the lighter background of hairs; upper surface loosely subappressed-hairy, the lower less velutinous-tomentose with white hairs, basal cilia indistinct; petioles approximately 1/3 as long as blade, clearly delimited from blade in lower leaves; bracts flat, short-petioled; the lowermost often resembling stem-leaves, others smaller, oblong or oblong-ovate, cuneate at base, acute, entire laterally, with few small acute teeth only at apex, the uppermost broadly lanceolate, entire, vestiture of inflorescence axis like that of the stem; verticillasters 3–6-flowered, all or only the lower and the middle ones remote, forming a loose, often very long simple raceme; flowers 10–12 mm long, on pedicels 2/3 as long as calyx; calyx tubular-campanulate, very dark purple-violet (almost black, like stems in upper part), rather densely covered with patent or reclinate hairs of medium length, the teeth triangular, long-acuminate, 1½ times as long as wide, with very profuse short and scattered long cilia; corolla very dark purple (nearly black). June–August. (Plate IV, Figure 3.)

Grassy mountain slopes. — European part: Crim. Endemic. Described from the vicinity of Old Crimea, Golyi Agarmysh Mountain. Type in Leningrad.

Note. The distribution area of this species is completely separated from that of the true *T. syspirense* C. Koch which has not so far been found anywhere in the Caucasus and for this reason we feel justified in treating the Crimean form as a separate taxonomic unit, notwithstanding its relatively limited distinctiveness.

16. **T. excelsum** Juz. sp. nov. in Addenda, XIX, 505. — *T. chamaedrys* ssp. *syspirense* Reching. fil. in Bot. Arch. 42 (1941) 377, p. p. non *T. syspirense* C. Koch. — Exs.: Sintenis, It. transcasp.-pers. 1900–1901, No. 1054.

63 Perennial, woody and branching at base; flowering stems usually many, upright or nearly so, 12–45 cm long, moderately sturdy, straight or slightly flexuous, rather densely covered with white, spreading and slightly reclinate hairs; leaves 1.2–3 cm long, 0.8–2 cm wide, elliptic or broadly ovate, approximately 1½ times as long as wide, broadly cuneate at base or (the upper) narrowly cuneate, obtuse or acute at apex, irregularly and largely incised-crenate-dentate, sparsely covered above with whitish curved hairs, more densely so beneath, but not velutinous; teeth 4–7 on each margin elongate, obliquely antrorse, often double, nearly half of half-blade width, blade flat; lateral veins 4–6, usually branching, scarcely impressed above, slightly protruding beneath; petioles very short, not more than 1/4 the length of blade, sometimes in lowermost leaves clearly delimited from blade; lower bracts resembling upper cauline leaves, gradually smaller toward summit, oblong-rhombic with narrowly cuneate base, acute, sharp-toothed in upper half; upper bracts oblong-elliptic, with few acute denticles only at apex, subsessile, flattish, the uppermost frequently entire; vesture of inflorescence axis like that of the stem; verticillasters 2–5-flowered, the lower distant, the others closely approximate; inflorescence racemose, or distally rather dense, sometimes slightly branching at base; flowers 1.3 cm long, on pedicels exceeding half the length of calyx; calyx obconical or subcampanulate, green or mostly purple-violet, densely covered with moderately long patent recurved hairs; teeth triangular, long-acuminate, 1½ times as long as wide, hairy on the margins and sometimes on the midnerve; corolla purple. End of May–July.

Gravelly mountain slopes with steppe vegetation, pebble-beds along banks of mountain streams. — Centr. Asia: Mtn. Turkm. **Gen. distr.:** Iran. Described from Ai-Dere gorge. Type in Leningrad.

Note. In referring *T. excelsum* to the series *Syspirensia*, we have adopted the approach of Rehinger who does not distinguish this species from *T. syspirensis* C. Koch. It should be noted, however, that in some of its features, notably the size and shape of the leaf teeth, and the bracts that are not quite typical for this group, *T. excelsum* comes very close to the species of the preceding series (*Eu-chamaedrys* Juz.). In such “intermediate” nature of its characters it is comparable to *T. fischeri* Juz. In general, its taxonomic position needs further clarification.

Series 4. *Cana* Juz. — Stems and lower side of leaves appressed-white-tomentose; stems and leaves nearly devoid of simple spreading hairs.

17. *T. canum* Fisch. et Mey. Ind. sem. hort. Petrop. 1 (1835) 40; Ldb. Fl. Ross. III, 445; Reching. fil. in Bot. Arch. 42, 405. — *T. chamaedrys* var. *canum* Boiss. Fl. or. IV (1879) 813, p. p. — Ic.: Reching. fil. l. c. f. 32 and 69.

64 Perennial, woody at base, non-stoloniferous; flowering stems elongate, virgate, 15–45 cm long, arched-ascending or upright, canescent all over with very short appressed tomentum; leaves distant, 0.8–2.5 cm long, 2–3 mm wide, generally shorter than internodes, erect, subcoriaceous, the lower narrowly ovate or obovate, the upper ovate-lanceolate or oblanceolate, convex, strongly revolute-margined, long-cuneate at base, gradually tapering to petiole, obtuse or acute at apex; teeth 5–8 on each margin, fine, short, rounded or acute;

lateral veins 4-5, irregularly branching; upper surface sparsely covered with fine short curved hairs; lower surface with vestiture like that on the stem; petioles lacking cilia, in lower and middle leaves to 1/3 the length of blade, in uppermost leaves very short; inflorescence axis with hairs like those on the stem, interspersed above with longer patent hairs; lowermost bracts resembling stem-leaves, others entire, sessile, strongly revolute-margined, ovate-lanceolate, acuminate, devoid of cilia, much shorter than calyx; verticillasters many, very distant, the lower many-flowered (6-flowered on the average); flowers 1.2-1.5 cm long, purple; pedicels about the length of calyx or shorter; calyx 5-7 mm long, campanulate, erect or slightly declined, covered with profuse short and fewer long patent hairs sometimes interspersed with very few glandular hairs, often slightly suffused with purple; teeth subequal, triangular, abruptly short-acuminate, scarcely longer than wide, half the length of the tube or slightly longer, the margin with profuse short and scattered long cilia; corolla nearly twice as long as the calyx, densely villous-hairy outside. June - August.

Dry hills, clayey slopes, rocks, stony places, mountain steppes, dry scrub. - Caucasus: Dag., E. Transc. Endemic. Described from Somkhetia. Type in Leningrad.

Note. The characters observed in *Syspyrensia* appear to be much more pronounced in the series *Cana*. Other species of this series grow in Lesser Armenia (*T. ixodes* Bornm.) and Cappadocia (*T. leucophyllum* Montbr. et Aucher).

65 A plant which is undoubtedly a hybrid *T. canum* × *T. chamaedrys* L. or more likely *T. canum* × *T. nuchense* C. Koch, which we have named *T. × alexeenkoanum* Juz. (in Addenda XIX, 342), was collected by Alekseenko near "Khaltanskaya Kazma" along the Ata-Chai River in the district of Kuba as No. 11037. The stems of this hybrid are moderately covered with short, crisp hairs; as compared with *T. canum*, the leaves, greenish beneath, have a broader base, they are more sparingly hairy, their teeth are cut more deeply, and the bracts are shorter and broader; verticillaster containing up to 7 flowers; calyx deeply purple-violet. Popov included this plant in his *T. chamaedrys* var. *pubescens* N. Pop. This "variety" is an exceedingly composite concept which, among other forms, also includes *T. syspirense* C. Koch. Alekseenko's plant undoubtedly displays superficial resemblance to the latter but differs markedly in the character of its vestiture.

Section 5. **Polium** Schreb. Verticill. gen. (1774) 20; Benth. Lab. gen. et sp. (1835) 663. - Perennials; verticillasters crowded in terminal ovoid or globular heads; calyx tubular-campanulate, the teeth subequal or the lower teeth slightly narrower and more acute than the upper.

Series 1. *Montana* Juz. - Flowers 1-1.5 cm long. Leaves entire.

18. **T. jailae** Juz. in Spisok rast. gerb. fl. SSSR, XI (1949) 144. - *T. montanum* auct. fl. taur. non L.; Ldb. Fl. Ross. III, 445, p. p.; non L.; N. Pop. in Mat. Fl. Kav. IV, 3, 40. - Exs.: Gerb. fl. SSSR, No. 3467.

Subshrub, with robust woody root to 1 cm in diameter, producing procumbent tufts of

66 varying size; stems low, much-branched, prostrate or ascending at the ends, densely soft-tomentose, rather slender, terete, whitish or with some reddish color showing from under the tomentum, the reduced internodes many times shorter than the leaves; leaves 4–18 mm long, 0.3–4 mm wide, crowded, lanceolate or sublinear, gradually tapering at base to very short petiole, obtuse at apex, usually markedly revolute-margined, densely tomentose and gray-green above, very densely white-tomentose beneath, with loose tomentum consisting, as on stems, of rather long but slightly crisp hairs; midrib strongly impressed above, prominent beneath; lateral veins indistinct, completely concealed by tomentum; flower-heads mostly solitary, usually 3–7-flowered, occasionally containing up to 20 and more flowers, dense, obconical or subglobular; bracts resembling stem-leaves but shorter; flowers 1.5 cm long, on short or very short pedicels; calyx tubular, gradually tapering at base, more or less densely tomentose, faintly anastomosing, pale green or faintly purple; teeth $2/5-1/3$ as long as the tube, somewhat unequal, narrowly triangular, gradually passing into short awn, erect or the upper at length moderately recurved; corolla sparingly pubescent outside, the tube not exceeding the calyx; lower lip much enlarged, the middle lobe nearly square, with a few lobules, finely denticulate, the lateral lobes much smaller, oblong-elliptic, nearly flat, rounded at apex, recurved like the middle lobe, without marginal cilia, the upper lobes similar to the lower but slightly larger, ciliate at margin, with greenish stripes on back; anthers greenish; nutlets ca. 2 mm long, ellipsoid, black, slightly rugose, with large pale areola. June–August. (Plate IV, Figure 4.)

Stony places (meadows and pastures), rocks, taluses. — European part: Crim. Endemic. Described from Ai Petrinskaya Yaila. Type in Leningrad.

19. **T. praemontanum** Klok. sp. nov. in Addenda XIX, 342.

67 Subshrub producing rather dense tufts 10–40 cm long; current year's flowering branches 2–10 cm long, densely canescent with short (to 0.25 mm) appressed or subappressed hairs; leaves oblong-obovate to sublinear, 5–20 mm long, 1.25–4 mm wide, entire, cuneately tapering at base to short or indistinct petiole, more or less revolute-margined, obtuse or rounded at apex, whitish beneath with fine short tomentum, dark green above with scattered hairs, these more distinct (to 0.5 mm long) in lower part; bracts linear-lanceolate, with petiolar attenuation at base, 5–12 mm long, 0.75–2 mm wide, the lower longer than calyx (but shorter than whole flower), the upper shorter; inflorescence terminal, capitate, rather dense, 5–15-flowered; pedicels 1–2 mm long (the lower sometimes to 3.5 mm long), covered with semi-appressed short hairs; calyx subtubular, 8–9 mm long, the tube covered outside with short appressed hairs; teeth sparsely long-ciliate at margin, the lower longer and narrower, lanceolate, 2.25–3 mm long, to 1 mm wide, terminating in short point, the upper shorter and wider, acutely triangular, unequal, the middle 1.75–2 mm long and as wide, the lateral 1.25–2 mm long, 1.25–1.5 mm wide, acuminate or tapering to a point 0.25–0.5 mm long, straight or often markedly recurved; corolla nearly twice as long as the calyx, whitish-yellowish, the tube broadening above, nearly erect, 5–6 mm long, the lip 7–10 mm long, the terminal lobe rounded, entire, concave, the lateral lobes oblong-elliptic, tapering to base, much smaller, the upper lobes oblong-ligulate, longer than the lateral; nutlets ovoid, ca. 1.75 mm long, 1 mm wide, rugose-pitted, blackish. June–July.

Limestone and chalk outcrops. — European part: U. Dns. (Ternopol' Region, Ukrainian

SSR, Berezhn district, Trostyanets and vicinity of Kremenets). Endemic. Described from Trostyanets. Type in Kiev.

Note. According to M.V. Klovov, who described this species, many specimens had been collected on a number of occasions by different people. Judging by these collections, the species occurs in the absence of *T. pannonicum* Kern. to which it does not appear to be closely related.

20. *T. pannonicum* Kern. in Oesterr. Bot. Zeitschr. XIII (1863) 384. — *T. montanum* Ldb. Fl. Ross. III, 445, p. p.; Shmal'g. Fl. II, 348, p. p. non L. — *T. montanum* var. *pannonicum* Briq. Pflanzenfam. IV, 3a (1897) 821. — *T. montanum* β . *hirsutum* Boiss. Fl. or. IV (1879) 819. — Exs.: Fl. exs. Austro-Hung. No. 2643.

Subshrub or small shrub, branching from woody base, with woody root; stems several to many, 8–25 cm long, prostrate or ascending, radially spreading, rarely suberect, loosely cespitose, stoutish, terete, villous with profuse white, slightly crisp hairs; internodes rather well developed, half as long as to equaling the leaves; leaves 0.8–2 cm long, 1–5 mm wide, sessile or very short-petioled, oblong, lanceolate or linear, tapering at base, subacute or obtuse at apex, entire, revolute-margined, villous-tomentose on both sides, sparsely so and hence dark green above, almost snow-white beneath; midrib moderately impressed above, somewhat prominent beneath, the lateral veins indistinct; verticillasters crowded in a terminal, subglobular, many-flowered head; bracts much smaller than the leaves; flowers 1–1.5 cm long, very short-pedicelled; calyx 5–8 mm long, tubular-campanulate, mostly sparsely gray-hairy, pale green; teeth 1/5–1/4 as long as the tube, terminating in a short subulate point, ciliate on the margin, 5-nerved; corolla whitish-sulfureous, the 5-lobed lip sparingly pubescent outside, the upper lobes with network of pale purple nerves; nutlets ovoid, dark brown, impressed-punctate. June–August.

Stony and rocky places (limestone), needlegrass-dominated areas. — European part: M. Dnp. (western part), U. Dns., Bes. **Gen. distr.:** Centr. Eur. (southeastern part). Described from Hungary and Transylvania. Type in Vienna.

- 68 Note. This species differs much more sharply from the genuine *T. montanum* L. (not encountered in the USSR) and from the two preceding species than do all these three species from each other. Possibly, *T. pannonicum* will have to be separated into a series which, we presume, would also include the Balkan *T. scropili* Velen.

Series 2. *Polia* Juz. — Flowers 5–8 mm long; leaves toothed.

21. *T. polium* L. Sp. pl. (1753) 566; Ldb. Fl. Ross. III, 445; Shmal'g. Fl. II, 348; N. Pop. in Mat. Fl. Kavk. IV, 3, 42. — *T. polium* γ . *vulgare* Benth. Lab. gen. et sp. (1835) 685. — *T. angustifolium* Benth. l. c. 686. — *Polium album* Mill. Gard. Dict. ed. VIII (1768) No. 4. — **lc.:** Hayne Arzn.-Gew. 8, tab. 5; Pflanzenfam. IV, 3a, 211, fig. 73C; Fedch. and Fl. Fl. Evrop. Ross. III, fig. 708 (malum). — Exs.: Lang et Szovits, Herb. ruth. No. 92; Rehm. et Wol. Fl. pol. No. 227; GRF, No. 581; Novopokr. Gerb. donsk. fl. No. 147; Sintenis, It. transcasp.-pers. 1900–1901, No. 26.

Subshrub with woody root, strongly branching from woody base; stems many, ascending at base and often strongly flexuous, rarely suberect, 5–40 cm long, terete, tough, densely short-appressed-tomentose, grayish, gray or sometimes snow-white, rarely yellowish or reddish (mostly in lower part), short-paniculate or often distally corymbiform, the internodes varying greatly in length; leaves half to twice the length of internodes, 0.5–3.5 cm long, 1.8 mm wide, linear, oblanceolate or oblong, cuneate at base, obtuse at apex, shallowly crenate-dentate or in lower part (1/3–2/3) entire, very often revolute-margined, frequently somewhat wrinkled, sessile, with vestiture as on stems (denser beneath), green or grayish above, grayish or gray beneath; inflorescences many at ends of stems and branches, short-peduncled, comprising few very crowded verticillasters, densely capitate, globular or ovoid, 0.8–2 cm across; bracts small, equaling or mostly shorter than the flowers, 3–5 mm long, linear or linear-spatulate, entire, revolute-margined, tomentose; flowers subsessile, 5–8 mm long, whitish or yellowish; calyx shortly tubular-campanulate, densely whitish- or white-tomentose, sulcate, the teeth subequal, short-triangular, obtuse, much shorter than the tube, concealed by tomentum; corolla only slightly exceeding the calyx, tomentose-villous outside; stamens slightly exserted. June–September. (Plate IV, Figure 5.)

69 Dry hills, clayey and stony slopes and bluffs, rocks, taluses, chalk and limestone outcrops, steppes, coastal sands. — European part: M. Dnp., U. Dns., Bes., Bl., Crim., L. Don, L.V.; Caucasus: universal; Centr. Asia: Ar.-Casp. (Mangyshlak), Mtn. Turkm. **Gen. distr.:** Med., Bal.-As. Min., Iran. Described from Italy and other West Mediterranean countries. Type in London.

Note. The plant varies markedly in habit, vestiture, shape and dentation of leaves. Its race composition has not been thoroughly investigated in the Soviet Union, but there is no doubt that widely different forms occur within the regions. This would suggest that the sporadically observed variability is due to differences in habitat conditions, or possibly we may have here some evidence of the occurrence of genuine “Jordanian” species. It should be mentioned that a whole series of “elementary species” of this cycle has been established for parts of the distribution area of *T. polium* s.l. outside the USSR. Many of them were discovered long ago by Miller. Jordan himself also had a part in the analysis of this cycle. Very many, if not the great majority, of the West European “species” of the cycle are cited by Popov (op. cit., 42–43) as synonyms of *T. polium* L. Popov, however, went to the other extreme in declaring that *T. polium* “is constant in every respect except for slight variations in the shape of the leaf blade” (p. 49).

Economic importance. Used in Western Europe as far back as the 16th century in the treatment of various ailments and has been cultivated in gardens.

Genus 1242.* **Amethystea**** L.

L. Sp. pl. (1753) 21

Flowers small, 3–5 mm long, blue, in peduncled cymes forming a loose paniculate inflorescence; calyx subglobose-campanulate, regular, cut to middle into 5 equal subulate-lanceolate acute teeth, usually blue, densely covered with short glandular hairs; corolla

* Treatment by E.V. Volkov.

** Amethyst — a bluish-violet precious stone; referring to the color of the flowers.

azure, ciliate, without a ring of hairs inside, 5-lobed; middle lobe of lower lip larger than the others, obovate, broader at front; other lobes equal, acuminate; stamens 2, inserted near base of lower lip, the upper sterile stamens reduced to short slender filaments without anthers; nutlets obovoid, convex, rugose, with curved lower margin, brown, 2 mm long. Annual herbs, with erect branching stem; leaves 3–5-partite, with lanceolate lobes; upper leaves very small.

1. **A. coerulea** L. Sp. pl. I (1753) 21; Bge. in Ldb. Fl. Alt. I, 19; Ldb. Fl. Ross. III, 441; Turcz. Fl. baic.-dahur. II, 435; Kom. Fl. Man'chzh. III, 336; Kom. and Alis. Oprod. rast. Dal'nevost. kraya, II, 895; Kryl. Fl. Zap. Sib. IX, 2294.

Annual; stems 10–20 cm long, usually bluish, erect, branching, 4-angled, covered with very short glandular hairs, more profusely so at internodes and in uppermost part; leaves 2–6 cm long, 1–2 (3) cm wide, cuneately tapering to short petiole, deeply 3–5-sect into lanceolate, dentate lobes, the terminal larger than the lateral, the upper side smooth or with sparse and very short hairs, the lower side paler; flowers sparingly pubescent, in cymes forming a small paniculate inflorescence; peduncles as long as or longer than leaves; calyx 2–3 mm long, 1.5 mm wide, campanulate, usually bluish, cut to the middle into 5 subulate-lanceolate acute teeth, rather densely punctate with short-stipitate glands; corolla longer than calyx, 3–3.5 mm long, blue, 5-lobed, ciliate at margins; stamens 2, exserted; nutlets brown, rugose, 2 mm long. July–August.

A weed, ubiquitous in inhabited areas, also pastures, river banks, stony slopes and taluses. — Centr. Asia: Dzu.-Tarb., T. Sh.; West Siberia: Alt.; East Siberia: Ang.-Say., Dau.; Far East: Uss. **Gen. distr.:** Iran., Mong., China (Manchuria). Described from Siberia. Type in London.

Tribe 2. ROSMARINEAE Briq. in Pflanzenfam. IV, 3a (1895) 207 et 216. — Calyx 12-nerved, 2-lipped, according to $\frac{3}{2}$ formula; corolla 2-lipped, with concave upper lip and 3-parted lower lip; stamens 2 (the lower), attached under upper lip, filaments with a tooth at base; anthers 1-celled; nutlets obovoid, with ventral surface of attachment.

Genus 1243.* **Rosmarinus**** L.

L. Sp. pl. (1753) 23.

Calyx ovoid-campanulate, 8–12-nerved, 2-lipped, the upper lip with 3 short teeth, the lower 2-toothed; corolla blue-violet (rarely white); upper lip emarginate or 2-fid; lower lip 3-lobed, the large middle lobe strongly concave and declined; stamens 2, with 1-celled anthers; nutlets smooth. Shrub, with evergreen entire leaves.

* Treatment by B.K. Shishkin.

** The derivation of the name Rosmarinus is unclear. Some authors attribute it to Greek *rhops*, low shrub, and *myrinos*, balsam shrub. Others suggest a less likely derivation from the Latin *ros*, dew, and *marinus*, of the sea, marine.

71 The genus contains four or five species native to the Mediterranean region. It is considered as monotypic by many taxonomists.

1. *R. officinalis* L. Sp. pl. (1753) 23. — *R. angustifolius* Mill. Gard. Dict. ed. VIII (1758) No. 1. — *R. latifolius* Mill. l. c. (1758) No. 2. — *R. officinalis vulgaris* Alefel, Landwirt. Fl. (1860) 186. — *R. officinalis* var. *genuina* Turill in Kew Bull. (1920) 105. — *Salvia rosmarinus* Schleid. Handb. Med.-Pharm. Bot. I (1852) 265. — **Ис.:** Barlikh. Russk. lekarstv. rast. IV, Plate 98 (1900); Komarov, Sbor, sushka i razved. lekarstv. rast. izd. 3-e, Plate 64 (1917).

Shrub, 50–200 cm high, strongly branching; branches ascending or erect, covered with gray, easily peeling bark; young branches obtusely 4-angled, pubescent, with axillary fascicles; leaves on very short petioles, evergreen, linear, obtuse, revolute-margined, rather thick, dark green above, subglabrous (with solitary minute stellate hairs), white-tomentose beneath, 1.5–3.5 cm long, 1.5–3 mm wide; flowers subsessile, in 5–10-flowered racemiform inflorescences at the end of short shoots; calyx gray-tomentose, with glabrous throat; corolla blue-violet, sparingly pubescent outside, the tube slightly exceeding the calyx; upper lip deeply emarginate; lower lip slightly longer, the large middle lobe toothed at margins; stamens exserted; nutlets globose-ovoid, 1.5–2 mm long, smooth, brownish. April–May.

The plant is distributed in the Mediterranean region from southern France and North Africa (Algeria, Tunisia) to Asia Minor. It is well known in England, France, Italy and other countries for its volatile oil.

In the USSR it is cultivated in the Crimea and Caucasus. It is native to the West Mediterranean floristic region where it is often a component of maquis vegetation.

Economic importance. Oil of rosemary, esteemed by the ancient Greeks and Romans, is obtained from the leaves and flowering shoots which are clipped up to three times a year. The yield of oil varies from 0.19 to 1.7% (up to 2% from some leaves) depending on origin and management. The composition of the oil is complex, the main component being pinene (up to 80%). Oil of rosemary is used in many brands of eau de Cologne; it is also known as moth-repellent.

72 Subfamily 2. **SCUTELLARIOIDEAE** Briq. in Pflanzenfam. IV, 3a (1895) 207 et 224. — Calyx 2-lipped, both lips entire; corolla 2-lipped, the upper galeate; stamens 4, ascending under the upper lip, the lower longer than the upper; ovary 4-parted; nutlets depressed-globose, with dry exocarp, basally attached to receptacle (gynophore); surface of attachment small, orbicular; ovules amphitropous; seeds transverse; embryo with a bent radicle lying on one cotyledon. Herbs, seldom shrubs.

Note. The characteristic position of the ovules and shape of the embryo, which do not occur in any other members of the family, prompted segregation of this group as a family (Caruel. Sur la nouvelle famille des Scutellariacées. Bull. de la Soc. Bot. de France, tab. XXXIII, 1886, 266–268). In the Soviet literature, a similar approach was adopted by Nevskii. However, considering that this group does not otherwise differ from other Labiatae (the other features of Scutellarioideae are to be found in various genuine Labiatae), we treat it, in agreement with Briquet, as a subfamily, all the more so since its extent has not

been finalized to this day. Caruel included in this group the genera *Scutellaria* L., *Salazaria* Torr., *Perilomia* H.B.K. and (provisionally) *Catoptheria* Benth.; Briquet admitted only the first two. In his classification, Briquet assigns to *Perilomia* the status of a tribe, *Perilomieae*, and attaches it to the subfamily *Stachydoideae*, but he himself expresses doubt as regards the taxonomic position of one of the sections of *Perilomia* Kunth., namely *Aprosphylla* Briq. (species of the latter have been included in the genus *Scutellaria* by some authors).

Genus 1244.* **Scutellaria**** L.

L. Sp. pl. (1753) 598.

73 Flowers solitary, in axils of undifferentiated or more or less differentiated bracts, in the latter case forming racemose or spicate inflorescences; calyx campanulate, dorsoventrally flattened, 2-lipped, with entire broadly rounded lips that are closed in fruit, usually splitting into two unequal flaplike parts, the lower persistent and the upper falling away (sometimes both persistent or both deciduous); upper part of calyx frequently bearing a rounded and usually concave scalelike appendage (fold), a so-called scutellum, as long as or longer than the remaining part of the upper "flap," rarely of different shape or obsolete; corolla-tube long, mostly exserted, curved upward, dilated above; limb of corolla 2-lipped; upper lip ascending to upright, strongly inflated, galeate, entire or emarginate, the lateral lobes free or adnate to the upper rather than the lower lip; lower lip broad, flat, shorter or longer than the upper; stamens 4, didynamous, ascending, the ciliate anthers approximate in pairs; the lower longer, 1-celled by partial abortion, the upper with 2 divergent cells; disk elongating into columelliform or turbinate, erect or curved gynophore, this bearing 4 nutlets and an unevenly 2-cleft style with very short upper lobe; nutlets depressed-globose or ovoid, mostly tubercled, often pubescent, rarely smooth; embryo with curved radicle. Perennial or very rarely annual herbs, subshrubs, seldom shrubs, mostly odorless, the vestiture of simple hairs often interspersed with glandular. Leaves mostly petiolate, varying in shape, entire or toothed.

Note. A very large and polymorphic genus, usually separated into two subgenera, *Eu-scutellaria* Briq. and *Scutellariopsis* Briq. The latter does not occur in the USSR, and thus all Soviet species might be expected to belong exclusively to *Eu-scutellaria*. However, investigation of Central Asian representatives of the genus reveals a number of unusual types that fail to conform to the characteristics of any of the sections of this subgenus, and it would take some very forced interpretation to justify their inclusion. We were, therefore, compelled to establish three new subgenera of *Scutellaria*. With a more fragmentized approach to the category of genus, these subgenera could indeed be raised to generic status with no less validity than the section *Heteranthesia* Briq., of the subgenus *Eu-scutellaria* (not represented in the USSR in wild state) which Grossgeim (in Izv. Azerb. fil. AN SSSR, No. 3, 1945, 89) proposed to set up as a separate genus. In fact, generic

* Treatment by S.V. Yuzepchuk.

** From the Latin *scutellum*, dish, referring to the shape of the appendage in the upper part of the calyx of most of the species of the genus. The Russian name of this genus, "shlemnik" [shlem = helmet], does not correspond to the now accepted Latin name, but to an older one — *Cassida* (from *cassis* or *cassida*, helmet) which is mentioned by Bock.

names have already been proposed in the literature for two of the subgenera in question. We refrain from such treatment, taking into consideration that all these groups are apparently derived from the subgenus *Eu-scutellaria*; being relatively recent, they do not deviate markedly from the genus *Scutellaria* s. str.

Economic importance. It is interesting to note that, while most of the Labiatae are plants yielding volatile oil and are mainly used as such, species of *Scutellaria* are a striking exception to the rule. Most of them are presumably dye plants but very few have been investigated and evaluated in this respect.

74 Many scullcaps are ornamental, but again few of the Soviet species have been introduced into cultivation. Some species are of medicinal value.

See also notes to individual species.

Key to Subgenera

- 1. Upper part of calyx with a dorsal appendage 2.
- + Upper part of calyx unappendaged, sometimes with a small bulge on back 3.
- 2. Appendage on the upper (deciduous) part of calyx forming a concave or flat fold, a so-called scutellum Subgenus 1. **Euscutellaria** Briq. (p. 51).
- + Appendage on the upper part of calyx globose, bladderlike Subgenus 2. **Cystaspis** Juz. (p. 133).
- 3. Flowers in a lax secund inflorescence; calyx not concealed by bracts, entire, early deciduous, scarious Subgenus 3. **Anaspis** (Reching. fil.) Juz. (p. 138).
- + Flowers in dense quadrilateral inflorescences; calyx concealed by bracts, long persistent, conchoidal Subgenus 4. **Apeltanthus** (Nevski) Juz. (p. 144).

Subgenus 1. **Euscutellaria** Briq. in Pflanzenfam. IV, 3a (1896) 225, prosect. — Flowers variously disposed; calyx accrescent, in fruit, both lips scarious or coriaceous, unequal, the appendage on the upper lip (scutellum) arched-concave, rounded at apex, functioning, at least in many species (of the sections *Stachymacris* and *Lupulinaria*), as a kind of lever which, in maturity, causes the upper part of the calyx to break away at the slightest touch, thus promoting dispersal of the nutlets. Herbs (perennial or rarely annual), subshrubs or sometimes shrubs of very varied habit.

- 1. Flowers turned to one side to form a secund inflorescence; bracts herbaceous 2.
- + Flowers in quadrilateral inflorescences; bracts more or less membranous, rarely subherbaceous 25.
- 2. Flowers in the axils of normal leaves which gradually diminish in size toward the summit, or forming a racemose inflorescence and then bracts leaflike though somewhat smaller. 3.
- + Bracts distinguished from the crenate-dentate cauline leaves by their small size and entire margin 18.
- 3. Low, procumbent, West Caucasian high-mountain plants, with purple flowers; bracts entire, markedly smaller than the obscurely crenate or entire cauline leaves 4.
- + Plants different 5.

4. Leaves approximate, glabrous or ciliate in lower part; bracts ciliate-hairy along upper margin; calyx shortly stipitate-glandular in addition to being sparsely hirsute 23. **S. pontica** C. Koch.
- + Leaves distant, diffusely hairy above and on the veins beneath, the margin long-ciliate; bracts resembling cauline leaves but more densely hairy; calyx densely hispid, the bristles interspersed with stipitate glands 24. **S. helenae** Alb.
5. Leaves lanceolate, mostly attenuate at base, entire, firm, frequently subcoriaceous, glabrous or sparingly pubescent above, foveolate-punctate beneath; flowers rather large (2–2.5 cm long), forming a racemose inflorescence, the bracts slightly smaller than the cauline leaves 14. **S. baicalensis** Georgi.
- + Leaves differing in at least some characters, flowers axillary, the subtending bracts not differing in any way from cauline leaves, gradually decreasing in size. 6.
6. Leaves not foveolate-punctate beneath, usually widest in lower part, gradually attenuate above, mostly subacute 7.
- + Leaves foveolate-punctate beneath, usually widest at middle, with nearly parallel margins, mostly obtuse 15.
7. Rhizome moniliform, consisting of white articulated tubers 13. **S. moniliorrhiza** Kom.
- + Rhizome not moniliform 8.
8. Leaves with strongly developed lower teeth, at least some hastate 9.
- + Leaves not hastate 11.
9. Flowers large, 13–22 cm long; pedicels eventually declined, not drooping 10.
- + Flowers very small, ca. 5 mm long; pedicels eventually drooping 8. **S. dependens** Maxim.
10. Leaves (at least the middle ones) distinctly hastate at base, often with 1–2 (4) obtuse teeth on basal lobes, otherwise entire 6. **S. hastifolia** L.
- + Leaves unevenly crenate-dentate below, with 2–10 teeth on each margin, entire above 7. **S. dubia** Tal. et Schir.
- 76 11. Flowers usually ca. 1.5 cm, sometimes to 2 cm long. 12.
- + Flowers larger, to 2.5 cm long 13.
12. Leaves dark green, mostly shallowly crenate-dentate, usually sparsely hairy beneath, sometimes glabrate 1. **S. galericulata** L.
- + Leaves pale or bright green, rather deeply crenate-dentate in lower part, densely covered beneath with short crisp hairs, often nearly velutinous (Far Eastern form) 2. **S. krasevii** Kom. et I. Schischk.
13. Leaves 1–2 cm wide, usually broadly lanceolate or oblong-ovate, with 4–14 well developed teeth 3. **S. yezoënsis** Kudo.
- + Leaves to 1 cm wide, lanceolate, entire or with few shallow crenations in lower part 14.
14. Plants 20–60 cm high; leaves densely short-hairy on both sides 4. **S. regeliana** Nakai.
- + Plants 10–35 cm high; leaves glabrous or with scattered hairs above, short-hairy on the veins and margins, with scattered small granular glands beneath 5. **S. ikonnikovii** Juz.
15. Leaves glabrous or sparingly hairy 16.

- + Leaves very hairy 17.
- 16. Stem simple or branching; the branches rather short, declined; leaves not many, usually not attenuate, obtuse; flowers 1.8–2.2 cm wide . . . 9. **S. scordiifolia** Fisch.
- + Branches very long, erect; leaves numerous, widest at base and gradually attenuate above, often acutish; flowers small, 1.4–1.7 cm long . . . 12. **S. polyphylla** Juz.
- 17. Stems mostly divaricately branching from base; leaves usually elliptic, rarely ovate or oblong, obtuse or rounded at apex, with slightly developed blunt teeth, densely hairy on both sides 10. **S. taquetii** Lévl. et Vaniot.
- + Stems usually simple or few-branched; leaves ovate or oblong-ovate, subacute to subobtuse at apex, with well developed sharp teeth, rather densely hairy on both sides 11. **S. tuminensis** Nakai.
- 18. Bracts generally shorter than calyx; leaves rather thin-textured, deeply and coarsely crenate-dentate. 19.
- 77 + Bracts as long as or longer than calyx; leaves mostly firm, rather shallowly and usually finely crenate 23.
- 19. Bracts ovate, rounded at base (European and Caucasian plants) 20.
- + Bracts lanceolate, tapering at both ends (Far Eastern plants) 21.
- 20. Corolla bicolor, whitish, with violet-blue upper lip; stems and leaves sparingly hairy 15. **S. altissima** L.
- + Corolla purple; plant wholly glabrous 16. **S. tournefortii** Benth.
- 21. Flowers to 1 cm long (Sakhalin) 19. **S. shikokiana** Mak.
- + Flowers twice as long (Ussuri) 22.
- 22. Leaves glabrous or with scattered hairs on the whole surface above, only on the veins beneath; calyx sparsely hairy 17. **S. ussuriensis** (Rgl.) Kudo.
- + Leaves more or less hairy on both sides; calyx rather densely hairy. 18. **S. pacifica** Juz.
- 23. Flowers whitish 24.
- + Flowers dingy mauve 22. **S. woronowii** Juz.
- 24. Stems and petioles covered with short, curved, reclinate or appressed hairs 20. **S. albida** L.
- + Stems and petioles with long patent hairs 21. **S. pallida** M.B.
- 25. Central Asian subshrubs; leaves small, entire, hairy, short-petioled; bracts leaflike but smaller 26.
- + Bracts well differentiated, mostly scarious 28.
- 26. Scutellum small, concave, raised across the upper lips of the calyx; leaves entire. 27.
- + Scutellum large, flat, fringing the upper lip of the calyx; leaves finely sinuate-dentate 27. **S. cristata** M. Pop.
- 27. Flowers solitary in axils of upper leaves, brownish-purple . . . 25. **S. colpodea** Nevski.
- 78 + Flowers in small subcapitate 3–7-flowered axillary inflorescences, creamy-yellow, purple-streaked or spotted 26. **S. striatella** Gontsch.
- 28. Verticillasters very distant 29.
- + Verticillasters closely approximate, forming a spicate inflorescence. 33.
- 29. Bracts ovate or lanceolate, usually acute, navicular, thinly tomentose 30.
- + Bracts ovate or broadly ovate, obtuse or short-acuminate, nearly flat, covered with simple and glandular hairs 31.

30. Leaves glaucescent beneath with thin tomentum; bracts lanceolate, long-acuminate, usually all navicular 28. **S. navicularis** Juz.
- + Leaves green on both sides; bracts ovate, rather short-acuminate, the lower often not navicular 29. **S. chenopodiifolia** Juz.
31. Corolla yellow, not anthocyanin-colored 30. **S. juzepeczukii** Gontsch.
- + Corolla with intensely anthocyanin-colored lower lip 32.
32. Lower lip of corolla nearly black-purple; calyx strongly accrescent in fruit, to 1 cm across 31. **S. litwinowii** Bornm. et Sint.
- + Lower lip of corolla bright blue; calyx slightly accrescent in fruit 32. **S. luteo-coerulea** Bornm. et Sint.
33. Inflorescences 1–2 cm long, densely capitate. Subshrubs, with virgate stems and very remote small leaves 34.
- + Inflorescences larger. 37.
34. Low, almost pulvinate subshrubs, with stout upright stems 7.5–10 cm high. 36. **S. squarrosa** Nevski.
- + A higher and slimmer fruticose plant, with slender virgate stems 10–50 cm high 35.
35. Stems covered all the way up with very short, curved, closely appressed hairs and a faint grayish bloom 34. **S. intermedia** M. Pop.
- + Vesture of stems different 36.
36. Stems short-hairy only in lower part, glabrous elsewhere; leaves narrow, lanceolate; flowers 2–2.5 cm long 33. **S. ramosissima** M. Pop.
- + Stems glabrate or with sparse short hairs usually interspersed with longer ones; leaves wider, ovate or oblong; flowers 1.5–2 cm long 35. **S. glabrata** Vved.
- 79 37. Leaves (at least initially) tomentose, white or gray beneath (and sometimes above) 38.
- + Leaves without tomentum, green on both sides or, if heavily pubescent, grayish-green 95.
38. Bracts not scarious, rather thinly tomentose, essentially eglandular, usually lanceolate or narrowly ovate, acute, navicular with pronounced keel, rarely wider and nearly flat, very rarely obtuse 39.
- + Bracts usually scarious, rarely somewhat tomentose but invariably with numerous stipitate or sessile glands, ovate, obtusish to acuminate, generally not distinctly navicular, at most slightly carinate 60.
39. Bracts eglandular 40.
- + Bracts with some glandular hairs 56.
40. Flowers yellow, sometimes with greenish, dark yellow or brownish spots on lower lip or on lateral lobes of upper lip 41.
- + Flowers at least partially anthocyanin-colored 48.
41. Crimean-Caucasian herbaceous plants 42.
- + Central Asian subshrubs 47.
42. Leaves oblong or lanceolate, cuneately tapering at base; petioles less than half as long as the blade 37. **S. araxensis** Grossh.
- + Leaves ovate, with truncate base; petioles only slightly shorter than the blade 43.
43. Bracts rather narrowly lanceolate, navicular; leaves ovate 44.
- + Bracts broadly lanceolate, not navicular; leaves oblong-ovate 46.

44. Stems and underside of leaves with patent short hairs 38. *S. taurica* Juz.
+ Stems and underside of leaves appressed-tomentose 45.
45. Leaves ovate; bracts lanceolate, acute 39. *S. stevenii* Juz.
80 + Leaves broadly ovate; bracts broadly lanceolate, acute or short-acuminate
. 40. *S. tatianae* Juz.
46. Bracts rather large, the lower 9-12 mm long. 41. *S. raddeana* Juz.
+ Bracts small, the lower 5-7 mm long. 42. *S. leptostegia* Juz.
47. Bracts lanceolate, navicular, acute 50. *S. comosa* Juz.
+ Bracts ovate, concave but not navicular, obtuse 52. *S. microdasys* Juz.
48. Subshrubs; leaves rather large; flowers essentially yellow, only the upper lip and its
lateral lobes anthocyanin-tinged 49.
+ Herbs; leaves small, up to 1 cm long, densely gray-tomentose on both sides; flowers
mostly purple, but if yellow then spotted or streaked with purple on lower lip and
on tube 50.
49. Leaves green or grayish-green above, rather sparingly pubescent, white- or gray-
tomentose beneath; bracts broadly lanceolate below, abruptly cuspidate, long-
hairy-ciliate on the margin, otherwise finely tomentose, all entire
. 51. *S. oxystegia* Juz.
+ Leaves grayish-green on both sides with rather dense tomentum; bracts ovate, acute,
rather sparsely tomentose, the lower mostly with solitary teeth
. 53. *S. androssovii* Juz.
50. Corolla completely anthocyanin-colored 51.
+ Corolla bicolor or variegated 53.
51. Bracts ovate, not navicular 46. *S. karkaralensis* Juz.
+ Bracts lanceolate, navicular 52.
52. Leaves shallowly incised-crenate, with short teeth; corolla purple
. 43. *S. grandiflora* Sims.
+ Leaves deeply incised-crenate-dentate, with oblong teeth; corolla blue
. 44. *S. tuvensis* Juz.
53. Bracts ovate, not navicular; corolla purple or yellow 45. *S. turgaica* Juz.
+ Bracts lanceolate, navicular 54.
54. Leaves villous-tomentose on both sides; corolla pink or purple, with a yellow spot
on lower lip 47. *S. nepetoides* M. Pop.
81 + Leaves appressed-tomentose on both sides; corolla generally yellow, with purple
and red spots and stripes on both lips and on the tube 55.
55. Stems softly patent-hairy; flowers to 2 cm long, cream-colored . . 48. *S. picta* Juz.
+ Stems covered with short curved hairs; flowers not more than 1.5 cm long, dingy-
yellow 49. *S. flabellulata* Juz.
56. Stems patent-hairy; leaves in maturity very sparingly tomentose beneath, nearly
green 57.
+ Stems appressed-tomentose; leaves with distinct whitish or grayish tomentum
beneath 58.
57. Stems numerous (20-25), suberect; leaves crenate 55. *S. kurssanovii* Pavl.
+ Stems usually fewer, ascending; leaves deeply cut 56. *S. titovii* Juz.

58. Central Asian subshrubs, with ascending or prostrate stems and deeply toothed leaves; flowers essentially yellow, but the upper lip commonly anthocyanin-tinged at apex 59.
- + Caucasian perennial, with erect stems and rather shallowly incised-crenate leaves; flowers yellow, not anthocyanin-tinged 79. **S. rhomboidalis** Grossh.
59. Stems ascending, green or faintly colored; bracts to 1-2 cm long; flowers 2-2.8 cm long, with rather wide tube 54. **S. mesostegia** Juz.
- + Stems prostrate, strongly anthocyanin-colored; bracts to 7 mm long; flowers 1.5-2.5 cm long, with very slender tube 57. **S. catharinae** Juz.
60. Flowers pink. High-mountain plant of Talass Ala-Tau. 114. **S. talassica** Juz.
- + Flowers yellow or sometimes bicolor (yellow and anthocyanin) 61.
61. Glands on the bracts usually a minor component of vesture, very small, usually discernible only under high magnification, short-stipitate, sometimes sessile. Herbs or subshrubs of Crimea-Caucasus, West Siberia or Central Asia (northern regions) 62.
- + Glands on the bracts usually a dominant component of vesture, large, long-stipitate, easily perceived. Subshrubs of Central Asia, West Tien Shan and Pamir-Alai 87.
62. Leaves rather shallowly crenate or dentate, the incisions not usually extending more than half way to midrib 63.
- + Leaves pinnately incised-dentate, the incisions usually extending more than half way to midrib 81.
63. Bracts with varied vesture, the lower with short appressed hairs, others with long spreading hairs interspersed with subsessile glands; stems elongate, suberect, slender, more or less virgate; leaves very remote, small, shallowly incised-crenate with numerous small teeth (5-9 on each margin) 72. **S. granulosa** Juz.
- + All bracts with same type of vesture. Plant with different habit (only *S. daghestanica* recalling the habit of *S. granulosa*, but its leaves more deeply incised-crenate) 64.
64. West Siberian and Baltic plant; stems covered with long, horizontally spreading hairs; leaves rather narrowly cuneate at base, sparsely pubescent beneath 63. **S. sieversii** Bge.
- + Plants differing in at least some characters 65.
65. Bracts with short, curved, generally appressed hairs and sessile glands (Caucasian plants) 66.
- + Bracts with long spreading hairs and stipitate glands 71.
66. Ciscaucasian species; bracts ovate, long-pointed at apex 67.
- + Transcaucasian species; bracts broadly ovate, scarcely longer than wide, short-pointed at apex 68.
67. Leaves oblong-ovate or narrowly triangular, with 5-13 teeth on each margin 68. **S. polyodon** Juz.
- + Leaves ovate or broadly ovate, with 3-8 teeth on each margin. 70. **S. oschtenica** Juz.
68. Bracts predominantly dentate 78. **S. karjaginii** Grossh.
- + Bracts entire or only the uppermost dentate 69.
69. Leaves thinly white-tomentose beneath with appressed hairs, the tomentum concealing the veins 73. **S. orientalis** L.

- 83 + Leaves softly gray-tomentose beneath with spreading hairs, the network of veins usually distinct, not concealed by tomentum 70.
70. Leaves incised-crenate or dentate with incisions less than half the half-blade width; leaves and bracts covered above with sparse appressed hairs. 75. *S. platystegia* Juz.
- + Leaves deeply incised-dentate with incisions usually not less than half the half-blade width; leaves and bracts densely appressed-hairy above 76. *S. grossheimiana* Juz.
71. Crimean-Caucasian plants, with short spreading hairs on stems and leaf petioles and frequently on the lower side of leaves 72.
- + Stems, petioles and the lower side of leaves appressed-tomentose 74.
72. Crimean-Novorossisk plants with incised-crenate or incised-dentate leaves, the incisions usually less than half the half-blade width 73.
- + Transcaucasian plants, with pectinately incised leaves, the incisions at least half the half-blade width 74. *S. sedelmeyerae* Juz.
73. Leaves broadly ovate or suborbicular, truncate at base, obtusely incised-crenate, the incisions 1-4 mm; bracts broadly ovate, acuminate or subacuminate, very densely glandular 66. *S. hirtella* Juz.
- + Leaves often ovate, obtusely angled at base, more deeply incised, with mostly acute teeth; bracts narrower, usually ovate, more strongly acuminate at apex, faintly glandular 67. *S. novorossica* Juz.
74. Bracts up to 1 cm long; flowers 1.5-2.5 cm long 75.
- + Bracts 1.5-2 cm long; flowers 2.2-4 cm long 77.
75. Dagestan plant, with suberect, elongate, more or less virgate stems; leaves usually 1/4 as long as internodes 71. *S. daghestanica* Grossh.
- + Crimean species, with rather short ascending stems; leaves not shorter than internodes 76.
76. Leaves ovate, to 2 cm long, with somewhat uneven but not spreading teeth; inflorescence relatively few-flowered, to 10 cm long in fruit; bracts acuminate; flowers always yellow 64. *S. hypopolia* Juz.
- + Leaves suborbicular, usually not more than 1.5 cm long, with slightly spreading teeth; inflorescence many-flowered, to 15 cm long in fruit; bracts obtuse or very short-acuminate; flowers pure yellow or purple or yellow-purple 65. *S. heterochroa* Juz.
- 84 77. Caucasian high-mountain plant; leaves subcordate or truncate at base, shallowly incised-crenate 69. *S. oreophila* Grossh.
- + Central Asian plant; leaves truncate or broadly cuneate at base, deeply incised-dentate 78.
78. Bracts broadly ovate, short-acuminate, with short appressed hairs only on margins and veins, rarely all over, covered with very small stipitate glands; stems usually strongly anthocyanin-colored 62. *S. krylovii* Juz.
- + Bracts narrowly ovate or ovate, mostly long-acuminate, rather densely covered with long spreading hairs and few stipitate glands; stems usually green or faintly anthocyanin-colored 79.
79. Leaves triangular-ovate or oblong, subacute; bracts acuminate 80.

- + Leaves shorter, rather broadly ovate or elliptic, obtuse; bracts subacute, not acuminate 59. **S. alberti** Juz.
- 80. Leaves large, with uneven, mostly subacute teeth; bracts usually long-acuminate; flowers to 3.7 cm long 58. **S. transiliensis** Juz.
- + Leaves small, with even obtuse teeth; flowers 0.5-1.5 cm long 61. **S. soongorica** Juz.
- 81. Bracts very faintly glandular, even the lowermost entire (Tien Shan) 60. **S. przewalskii** Juz.
- + Bracts distinctly glandular, often slightly dentate, especially the lowermost (Transcaucasian) 82.
- 82. Leaves mostly dissected scarcely more than half way to midrib, the lobes usually slightly narrower than the undissected part of blade 83.
- + Leaves mostly dissected more than half way, often nearly to midrib, the lobes usually as wide as or even wider than the undissected part of blade 86.
- 83. Bracts rather sparsely covered with short, closely appressed hairs and subsessile glands 73. **S. orientalis** L., forma.
- + Bracts rather densely covered with long spreading hairs and stipitate glands . . 84.
- 85 84. Leaves with horizontally spreading or even recurved lobes, appressed-hairy above, softly tomentose with patent hairs beneath, the network of veins not fully concealed by the tomentum 77. **S. artvinensis** Grossh.
- + Leaves with obliquely ascending lobes and different vesture, the lateral and secondary veins beneath concealed by the tomentum. 85.
- 85. Leaves predominantly covered on both sides with patent glandular hairs, these often completely concealing the sparse tomentum beneath . . 80. **S. prilipkoana** Grossh.
- + Leaves with short appressed hairs above, sparsely tomentose beneath, without patent glandular hairs 84. **S. araratica** Grossh.
- 86. Bracts at least partly dentate 81. **S. darriensis** Grossh.
- + Bracts entire 82. **S. sosnovskiyi** Takht.
- 87. Rather large, large-leaved mountain plants with bracts to 1 cm long 88.
- + Low-growing, small-leaved, high-mountain plants with bracts usually less than 1 cm long 93.
- 88. Leaves generally not anthocyanin-tinged 89.
- + Leaves at least partly anthocyanin-tinged beneath 91.
- 89. Leaves green or grayish-green with scattered hairs above, white- or gray-tomentose beneath, rather evenly crenate-dentate, with 4-10 crenations on each margin . . 90.
- + Leaves green at both sides, glabrous above, faintly tomentulose beneath, coarsely crenate-dentate, with 5-7 uneven obliquely antrorse teeth on each margin 90. **S. urticifolia** Juz.
- 90. Leaves deeply and finely crenate-dentate, densely tomentose beneath, the network of veins completely concealed by the tomentum; flowers 3-3.5 cm long 85. **S. adenostegia** Briq.
- + Leaves rather shallowly and coarsely crenate, loosely tomentose beneath, with clearly discernible network of veins. 86. **S. bucharica** Juz.
- 86 91. Plants of West Tien Shan; leaves with large, rather long subacute teeth 92.
- + Plants of Pamir-Alai; leaves with smaller, shorter and more obtuse teeth. 87. **S. gontscharovii** Juz.

92. Leaves broadly ovate or ovate-rhombic, rounded or broadly cuneate at base; bracts ovate to broadly ovate, at least the lower abruptly terminating in a usually recurved point, more or less uniformly glandular-hairy 88. *S. haematochlora* Juz.
- + Leaves ovate or narrowly rhombic, cuneate at base; bracts narrowly ovate, gradually tapering to a mostly straight point, slightly glandular or subglabrous between veins 89. *S. tschimganica* Juz.
93. Stems with more or less spreading hairs; leaves narrowly ovate, acute. 93. *S. angrenica* Juz. et Vved.
- + Stems appressed-tomentose; leaves broadly ovate, obtuse 94.
94. Leaves deeply, coarsely and unevenly toothed; bracts subacute to subobtuse, more or less violet; flowers yellow with purple lateral lobes, 2.2-3 cm long (Zeravshan basin) 91. *S. iskanderi* Juz.
- + Leaves rather shallowly, finely and evenly toothed; bracts obtuse, not usually colored; flowers plain yellow, 1.5-2.5 cm long (West Tien Shan). 92. *S. pycnoclada* Juz.
95. Low shrubs, with woody stems and branches 96.
- + Herbs, rarely subshrubs 99.
96. Leafy shoots and leaves with long-stipitate glands; leaf base mostly cordate 94. *S. cordifrons* Juz.
- + Leafy shoots and leaves with vestiture destitute of long-stipitate glands; leaf base mostly broadly cuneate or truncate, rarely subcordate. 97.
97. Central Asian species; lower lip of corolla mostly slightly pubescent at base, usually not longer than the upper lip 98.
- + Transcaucasian species; lower lip of corolla glabrous, longer than the upper lip 97. *S. sevanensis* Sosn.
98. Leaves ovate or oblong, often subacute, with acute teeth, glabrous or sparsely short-hairy above, usually densely covered beneath with short curved hairs and minute glands; stems and petioles usually eglandular; bracts elliptic, acute, usually entire except sometimes the lowermost 95. *S. adsurgens* M. Pop.
- + Leaves broadly ovate or suborbicular, obtuse, with obtuse teeth, usually densely short-hairy above, with thickish tomentum and short-stipitate glands beneath; stems and petioles very often with short-stipitate glands; bracts broadly ovate, usually obtuse, mostly crenate-dentate. 96. *S. phyllostachya* Juz.
99. High-mountain plants of Armenia (Mount Aragats), with leaves dissected nearly to midrib into very narrow linear segments; flowers as in species of the Orientales group (i.e. with long and slender, distally expanding tube and large lower lip). 83. *S. amphichlora* Juz.
- + Different from above 100.
100. Plants of Kara Tau Mountains; leaves very rigid, brittle when dry, densely covered on both sides with very short hairs, subvellutinous; inflorescence congested 122. *S. karatavica* Juz.
- + Leaves not rigid, with different vestiture; inflorescence rather lax. 101.
101. Plants mesophilous in habit; leaves rather sparingly hairy, rarely with fairly profuse hairs of moderate length 102.
- + Xerophilous plants; leaves rather densely covered on both sides with long, mostly somewhat flexuous hairs 118.

102. Rather large plants of mountains and plains; leaves copiously toothed (in more developed leaves 7-11 teeth on each margin) 103.
+ Low-growing high-mountain plants of Central Asia; leaves sparingly toothed (usually not more than 5 at each side) 113.
103. Flowers essentially violet 104.
+ Flowers essentially yellow 106.
104. Altai plants; leaves rounded or slightly cordate at base; flowers 2-2.5 cm long, violet, with paler lower lip and tube 104. **S. altaica** Fisch.
+ Leaves cuneate at base; flowers 2.5-3 cm long, of different color 105.
105. Plants of the Tuva ASSR, with dark azure corolla and very compact inflorescence 105. **S. mongolica** Sobolevsk.
- 88 + Tien Shan plants, with bicolored corolla (bright yellow tube and violet-purple lips) and rather lax inflorescence 108. **S. xanthosiphon** Juz.
106. Leaves deeply cordate, glandular 107. **S. knorringiae** Juz.
+ Leaves not cordate, rarely subcordate, eglandulose 107.
107. Ural and Asian plants with flowers 2.2-3.5 cm long 108.
+ European plants with flowers 1-2.5 cm long 110.
108. Ural plants with acute leaves; stems with fine, recurved hairs 102. **S. oxyphylla** Juz.
+ Siberian or Central Asian plants with obtuse leaves; stems with spreading hairs 109.
109. Stems covered with short reclinate hairs, these often interspersed with longer spreading hairs; inflorescence short and dense, 2.5-4 cm long; bracts broad, ovate, to 1.2 cm long, scarious, sparsely long-hairy; corolla yellow . . . 103. **S. supina** L.
+ Stems covered with short and long, horizontally spreading hairs; inflorescence slightly looser, to 8 cm long; bracts narrower, oblong-ovate, to 8 mm wide, subherbaceous, densely long-hairy; corolla yellow, the lower lip lilac, the upper lilac-tipped 120. **S. alexeenkoi** Juz.
110. Plants of western Ukraine; bracts early deciduous; petioles and base of leaves ciliate 98. **S. verna** Bess.
+ Plants different from above 111.
111. Stems much branched, the branches long, flexuous; upper lip of corolla with usually violet-tinged lateral lobes 100. **S. chitrovai** Juz.
+ Stems simple or sparingly short-branched; flowers plain yellow 112.
112. Narrow-leaved plants (chalks of Ukrainian SSR) 99. **S. cretica** Juz.
+ Broad-leaved plants (Central Povolzhye) 101. **S. cisvolgensis** Juz.
113. Flowers essentially yellow 114.
+ Flowers essentially anthocyanin-colored 117.
114. Leaves unevenly toothed, the teeth long, divaricate (Saur Range) 106. **S. irregularis** Juz.
- 89 + Leaves rather evenly crenate-dentate, the teeth not divaricate 115.
115. Leaves cordate at base, as wide as long or even wider (Kirgiz Alatau) 113. **S. popovii** Vved.
+ Leaves tapering or rounded at base, longer than wide 116.

116. Leaves to 2.4 cm long, 1.4 cm wide; stems rather densely covered with long patent hairs; leaves rather densely hairy beneath; corolla to 3.5 cm long (Tien Shan) 109. *S. oligodonta* Juz.
 + Leaves to 1.4 cm long, 0.9 cm wide; shoots with sparse very short hairs or subglabrous; leaves with scattered hairs; corolla ca. 2.5 cm long. (Pamir-Alai). 110. *S. paulsenii* Briq.
117. Bracts scarious, entire; flowers violet, with yellowish tube . . . 111. *S. filicaulis* Rgl.
 + Bracts subherbaceous, toothed; flowers lilac-purple 112. *S. kugarti* Juz.
118. Corolla yellow, the upper lip purple-tipped, the lower lip with 2 large round dark-brown spots (Zeravshan) 121. *S. ocellata* Juz.
 + Corolla without spots on lower lip (Tien Shan) 119.
119. Leaves (at least the lower) subcordate to cordate at base, the lateral veins arising mainly close to leaf base, hence venation apparently flabellate 120.
 + Leaves broadly cuneate at base, the lateral veins arising mainly from higher up the midrib, venation essentially pinnate 121.
120. Leafy shoots densely covered with rather long spreading hairs; leaves mostly grayish-green on both sides, with profuse, slightly crisp or nearly straight hairs of medium length (Talass Ala Tau) 115. *S. linczevskii* Juz.
 + Leafy shoots less densely covered with rather short hairs; leaves green on both sides, with scattered, short, crisp hairs (Kirgiz Alatau) 116. *S. subcordata* Juz.
- 90 121. Cespitose plants; stems and petioles with rather short hairs (Kara Tau) 117. *S. subcaespitosa* Pavl.
 + Non-cespitose plants; stems (at least in their lower part) and petioles densely covered with long hairs 122.
122. Stems in lower part, petioles and young leaves densely lanate-villous; leaves rugose, partly tomentose beneath, the veins strongly impressed above and very prominent beneath; bracts up to 1 cm long, mostly broadly ovate 118. *S. lanipes* Juz.
 + Stems in lower part, petioles and young leaves with sparser and shorter hairs; leaves not rugose, not tomentose beneath, the veins not strongly impressed above or prominent beneath; bracts to 1.7 cm long, elongate-elliptic 119. *S. toguztoraviensis* Juz.

Section 1. **Galericularia** A. Hamilt. Monogr. Scutell. in Ser. Bull. Bot. V (1832) 31. — Axillares Benth. in Bot. reg. 18 (1832) ad calcem, No. 1493. — Galericulatae Boiss. Fl. or. IV (1879) 681. — Flowers paired in the axils of normal leaves, these remote, gradually smaller toward summit, forming a secund inflorescence. Mostly upright, mesophilous perennials; leaves lanceolate, ovate or elliptic, sessile or the lower short-petioled, entire or slightly dentate. A group with holarctic distribution.

Series 1. *Eu-galericulatae* Juz. in Bot. mat. gerb. Bot. inst. ANSSSR, XIV (1951) 359. — Flowers medium-sized, usually ca. 1.5, sometimes to 2 cm long; rhizome slender; leaves usually shallowly crenate-dentate, not sagittate, the lower surfaces not foveolate-punctate.

1. *S. galericulata* L. Sp. pl. (1753) 599; Ldb. Fl. Ross. III, 398; Shmal'g. Fl. II, 327; Kryl. Fl. Zap. Sib. IX, 2296. — *S. galericulata* α . pubescens et β . vulgaris Benth. Lab. gen. et sp. (1834) 437. — *S. galericulata* α . genuina Rgl. Tent. Fl. Ussur. (1861) 118. — *S. pubescens* Martr. Fl. Tarn. (1864) 572. — *S. rosmarinifolia* Adams in herb. — *S. adamsii* Spreng. Syst. 2 (1825) 701. — *Cassida galericulata* Scop. Fl. carn. ed. II, 1 (1772) 430; Moench, Meth. (1794) 413. — *C. major* Gilib. Fl. Lithuan. I (1781) 90. — **Ис.:** Rchb. Ic. Fl. Germ. XVIII, tab. 1256; Syreishch. Ill. fl. Mosk. gub. III, 101. — **Exs.:** Pl. Finl. exs. No. 901; GRF, No. 683.

- 91 Perennial, with creeping branching rhizome; stems 8–50 (70) cm long, ascending or erect, simple or branching (sometimes strongly so), with internodes mostly shorter than the leaves, covered mainly on the ribs with short spreading or reclined hairs; leaves 2–6 (7) cm long, 0.5–2 cm wide, rather firm, oblong-ovate or broadly lanceolate, truncate or cordate at base, gradually attenuate above, subobtuse to obtuse, shallowly and obtusely crenate-dentate, with 2–8 very flat, often indistinct crenations on each margin, sparsely hairy or glabrous, dark green above, usually covered beneath with sparse short spreading curved or even crisp hairs, or hairy only on margins and veins or sometimes subglabrous, usually not punctate, pale green, often becoming lilac (like the stems); petioles short, broad, with vestiture as on the stems; flowers solitary in the axils of middle or upper leaves, on pedicels 1–2 mm long, forming a lax secund inflorescence; calyx 3–4 mm long, in fruit to 5 mm, as long as or slightly shorter than the pedicel, with short curved hairs (mostly eglandular), usually colored; corolla 1.2–2.6 cm long, violet-blue, glandular-hairy outside; upper lip as long as or slightly shorter than the orbicular-reniform slightly cleft lower lip; nutlets 1.5 mm across, angular-ovoid, light brown, finely tuberculate. June–September.

Flooded and swampy meadows, bogs and marshy forests, shrubs, damp banks of rivers, brooks and lakes, ditches. — European part: Kar.-Lap., Dv.-Pech., V.-Kama, Balt., Lad.-Ilm., U.V., U. Dnp., M. Dnp., U. Dns., Bes., Bl., V.-Don, Transv., L.V.; Caucasus: Cisc., E. and S. Transc., W. Transc. (see Note); West Siberia: all regions; East Siberia: all regions; Centr. Asia: Ar.-Casp., Balkh., Amu D., Dzu.-Tarb., T. Sh., Pam.-Al., Mtn. Turkm. **Gen. distr.:** Scand., Atl. and Centr. Eur., Med. (sporadically), Bal.-As. Min. (northern part of Balkans), Mong., Ch., Jap. Described from Europe. Type in London.

Note. A highly variable plant, prone to produce poorly defined local races. Specimens from Western Transcaucasia are very uniform; they are distinguished by high growth, strongly branching stems and leaves glabrous on both sides, with hairs confined to the veins (*S. phasiana* Juz. ined.). A Far Eastern (Ussuri) race is described below. A North American race was described as *S. epilobiifolia* A. Ham. (Monogr. Scutell., 1832, 32).

- 92 **Economic importance.** In former times the plant was used medicinally, mainly in the treatment of malaria ("herba Tertianariae"). It is popularly used for its hemostatic action. A dyeing agent.

2. *S. krasevii* Kom. et I. Schischk. in sched. (1927) ex Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 357. — *S. galericulata* β . pubescens Rgl. Tent. Fl. Ussur. (1861) 118, non alior. — *S. scordifolia* var. *velutina* Kom. in sched. (1924) sec. Juz. l. c.

Perennial, with creeping rhizome; stems 32–75 cm long, erect, simple or mostly branching from base or above, the branches long, subappressed or obliquely ascending, covered on the ribs with short reclinate hairs, the internodes as long as the leaves or shorter; leaves

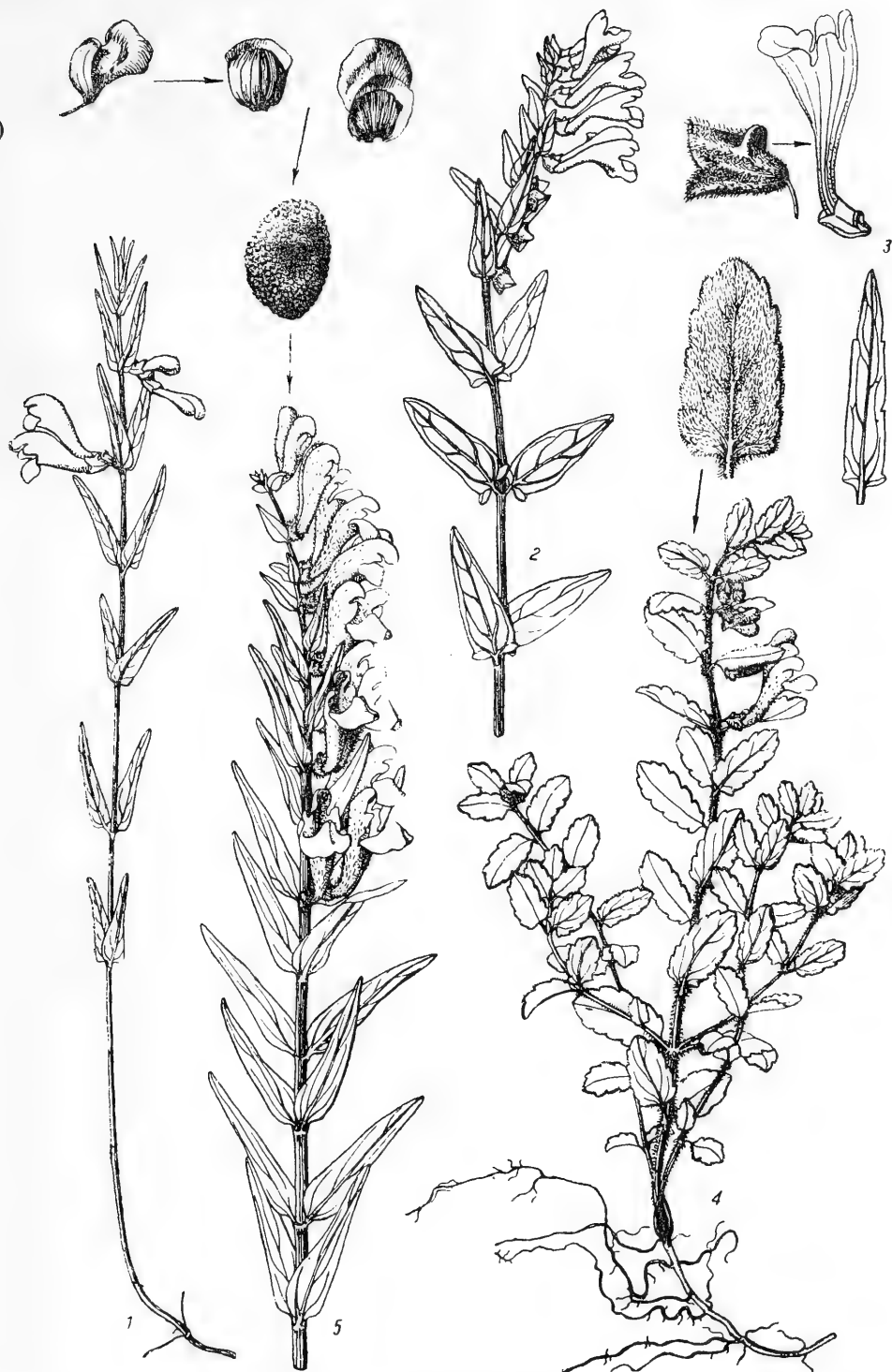


PLATE V. 1 – *Scutellaria ikonnikovii* Juz., general aspect; 2 – *S. hastifolia* L., end of stem; 3 – *S. scordiifolia* Fisch., leaf, flower, calyx; 4 – *S. taquetii* Lévl. et Vaniot, general aspect, leaf; 5 – *S. baicalensis* Georgi, summit of stem, calyx, upper and lower part of fruiting calyx, nutlet.

rather thin, 1.2–4.5 cm long, 0.5–2 cm wide, ovate or triangular-ovate, cordate or truncate at base, rather abruptly attenuate at apex, obtuse to subacute, rather deeply and unevenly crenate-dentate below, with 2–7 obtuse or acute teeth on each margin, entire toward apex, pale or bright green with short appressed hairs above, the undersurface mostly densely covered with short crisp hairs, often nearly velutinous, gray-green, the veins with profuse short retrorse hairs; petioles short, covered with reclinate hairs; flowers small; calyx ca. 3 mm long, with profuse short patent hairs; corolla violet-blue, densely hairy outside, mostly ca. 1.5 cm long; upper lip much shorter than the lower; nutlets ca. 1.5 mm across, globose-ovoid, yellowish, finely and closely tuberculate. July.

Thickets of purple osier, cane, common reed and smallreed along banks of rivers and lakes, oxbow-lakes and backwaters. — Far East: Uss. (?), Uda. Endemic? Described from Gaivoron village in Spassk-Dalni region. Type in Leningrad.

Note. The morphological differences between this race and the typical *S. galericulata* L. are negligible and difficult to discern. Nevertheless, we are presenting it here as an independent unit, chiefly because of some disjunction in its distribution area.

Series 2. *Regeliana* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 359. — Like *Eu-galericulata* Juz., but the flowers rather large, to 2.5 cm long.

- 95 Note. Even though Hultén questioned the specific status of one of the forms concerned (*S. yezoënsis* Kudo) and argued (Fl. of Kamtch. IV, 1930, 88) that its distinguishing characters lie within the variation range of *S. galericulata* L., there are strong indications for the distinctiveness of large-flowered East Asian forms of the *S. galericulata*—*S. latissima* type. Most convincing is the fact that the distribution area of two of these forms (*S. ikonnikovii* Juz. and *S. regeliana* Nakai) partly overlaps the area of *S. galericulata* s. l. (incl. *S. krusevii*). See, however, Note to *S. yezoënsis*.

3. *S. yezoënsis* Kudo in Journ. Coll. Sc. Univers. Tokyo, XLIII, art. 8 (1921). — *S. galericulata* Fr. Schm. Fl. Sachal. (1868) 165, non L. — Ic.: Kudo, l. c. tab. I, fig. 9.

Perennial; stem 35–70 cm long, erect, simple or branching, often with elongate internodes, sparsely crisp-hairy on the ribs, otherwise glabrous; leaves 2.5–5.5 cm long, 1–2 cm wide, thin, oblong-lanceolate, ovate-lanceolate or elongate-ovate, truncate or shallowly cordate at base, acute at apex, distinctly crenate-dentate with 4–14 short teeth on each margin, with short crisp hairs or subglabrous or scabridulous above, paler, with rather profuse short crisp hairs beneath, densely and finely appressed-hairy on midrib; petiole to 4 mm long (in lower leaves), with hairs as on midrib; bracts like the leaves but gradually smaller toward apex, oblong-lanceolate, cordate at base, acuminate, obscurely and finely crenate-dentate or nearly entire; flowers axillary, remote, on pedicels approximately half the length of calyx; calyx 4–5 mm long, densely covered with short white slightly crisp hairs; corolla 2–2.4 cm long, violet-blue, crisp-hairy outside; nutlets 1.5–1.8 mm long, ellipsoid, densely covered with small tubercles. July–August.

River valleys, shores of lakes. — Far East: Kamch. (?), Sakh. (Kuriles). **Gen. distr.:** Japan. Described from Japan (Kyushu). Type in Tokyo.

Note. This species combines the characters of the series *Eu-galericulatae* (leaf shape and dentation) and *Regeliana* (flower size) and could be included in the former (but then, the characterization of the series would have to be modified).

4. *S. regeliana* Nakai in Bot. Mag. Tokyo, XXXV (1921) 197. — *S. galericulata* γ. *angustifolia* Rgl. Tent. Fl. Ussur. (1861) 118. — *S. angustifolia* Kom. in Tr. Bot. sada, XXV, II (1907) 345, p. p. non Pursh nec Adams. — **lc.**: Komarov, op. cit. Table IV, Figure 1; Kom. and Alis. Opred. rast. Dal'nevost. kraya, II, Plate 271, 6–10.

Perennial, with slender, creeping, rarely vertical rootstock; stems solitary, 20–60 cm long, erect, mostly simple, sometimes with long appressed branches from base, mostly few-branched, with elongate internodes (especially in lower part), densely short-hairy on the ribs or all over, frequently becoming lilac (like lower side of leaves); leaves gray-green, oblong or lanceolate, 1–4 cm long, 0.2–0.8 cm wide, attenuate above but obtusely rounded at apex, rarely acute, entire or, especially in lower part, with few shallow and flat, often indistinct crenations, frequently slightly revolute-margined, short-petioled or sessile, densely covered on both sides with short hairs, these short antrorse setiform above, softer curved or slightly crisp beneath, antrorsely appressed on the veins; flowers few, large, on short erect pedicels in the axils of middle and upper leaves; calyx always densely covered with short curved white hairs; corolla 1.5–2.5 (usually 2) cm long, blue-violet, with sporadic pubescence and short stipitate glands, the tube markedly curved, the throat ca. 1 cm wide; nutlets with slender papilliform tubercles over entire surface. July–September.

Banks of rivers and oxbow-lakes, swampy meadows, sometimes also sphagnum bogs, more rarely birch groves, wastelands. — Far East: Uss. **Gen. distr.**: China (Manchuria), Korea. Described from the Ussuri River valley, Usachi Mountain and estuary of Iman River. Type and paratype in Leningrad.

5. *S. ikonnikovii* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 358. — *S. angustifolia* Kom. in Tr. Bot. sada, XXV, II (1907) 345, p. p. non Pursh nec Adams. — *S. regeliana* Ikonnikov in sched. ex Juz. l. c. non Nakai. — *S. galericulata* Ldb. Fl. Ross. III, 398, p. p. non L. — *S. galericulata* var. *subintegerrima* F. Schm. in sched. ex Juz. l. c. — **lc.**: Sugawara, Ill. fl. of Saghal. IV, tab. 725.

Perennial, similar to *S. regeliana* Nakai but usually smaller; stem 10–35 cm long, the ribs covered with very short appressed hairs; leaves bright green, glabrous or with scattered hairs above, with very short appressed hairs beneath only on the veins and margins, elsewhere diffusely and finely grainy-glandular; flowers disproportionately large for the size of the plant, to 2.5 cm long. July–August. (Plate V, Figure 1.)

River banks, meadows and swamps. — East Siberia: Ang.-Say. (shores of Baikal, Kultuk settlement), Dau., Lena-Kol.; Far East: Uda, Ze.-Bu., Uss. (western part), Sakh. **Gen. distr.**: Mong. Described from Transbaikalia (Chitinskaya highway, Karymskoe). Type in Leningrad.

Series 3. *Hastifoliae* Juz. - Similar to *Eu-galericulatae* but leaves broader at base, with lowermost teeth exceptionally well developed and thus more or less hastate, entire above.

6. *S. hastifolia* L. Sp. pl. (1753) 599; Ldb. Fl. Ross. III, 399; Shmal'g. Fl. II, 328; Kryl. Fl. Zap. Sib. IX, 2298. — *Cassida hastifolia* Scop. Fl. Carn. I, ed. II (1772) 430. — **lc.**: Rchb. Ic. Fl. Germ. XVIII, 1256; Syreishch. Ill. Fl. Mosk. gub. III, 111. — **Exs.**: Fl. pol. exs. No. 767 (nom. *S. galericulata*).

Perennial, with a very slender creeping rhizome and short stolons; stems 15–40 cm long, ascending, simple, rarely branching, glabrous or with short hairs mainly on the ribs; leaves 12–18 mm long, 6–12 mm wide, oblong-ovate or oblong-lanceolate, orbicular or truncate at base, the middle and often the lower hastate at base, often with 1–2 (3–4) obtuse teeth on the lobes, otherwise entire, obtuse at apex, glabrous or diffusely pillulose above, only on margins and sometimes on the veins with very short hairs, otherwise glabrous, frequently becoming lilac beneath (like stems); petioles 2–5 (10) mm long; inflorescence a short loose secund spikelike raceme; flowers paired in the axils of upper cauline leaves which they exceed in length; pedicels short, covered (like the subtending leaves) with short glandular hairs; calyx 2.5–4 mm long, slightly longer than the pedicel, often densely glandular-hairy, usually violet; corolla (13) 17–22 mm long, blue-violet, glandular-hairy outside; lateral lobes of upper lip rounded, slightly shorter than the middle lobe; lower lip rounded-reniform, obtuse or scarcely cleft; nutlets 1–1.5 mm across, papillose-tubercled. June–August. (Plate V, Figure 2.)

River banks, swampy meadows, coppices, oak forests. — European part: Balt., Lad.-Ilm., U.V., U. Dnp., M. Dnp., U. Dns., Bes., Bl., V.-Don, L. Don; Caucasus: Cisc.; West Siberia: Ob. **Gen. distr.:** Scand., Atl. and Centr. Eur., Bal.-As. Min. Described from Sweden. Type in London.

7. **S. dubia** Tal. et Schir. in Sb. tr. Khar'kovsk. veterin. inst. VII, 6 (1906) 60 (rossice); Shiryayev in Tr. Bot. sada Nyur'evsk. univ. XII (1911) 22 (diagn. lat.). — *S. tatarica* Fisch. in sched. — *S. hastifolia* f. *wolgensis* Schennikov in sched. — **lc.:** Taliev and Shiryayev, op. cit. 60; Stankov–Taliev, Opred. 860.

- 98 Perennial; stems 20–55 cm long, erect or ascending, straight or slightly flexuous, simple or often branching, glabrous or very finely hairy, very leafy; leaves on distinct but frequently short, glabrous or finely hairy petioles, the lower to 3–4 cm long, 2 cm wide, the upper leaves gradually smaller; lower leaves of lateral branches 2–2.5 cm long, 0.8–1.3 cm wide, others smaller, all triangular-ovate, truncate or cordate at base, obtuse at apex, unevenly crenate-dentate in lower part, with 2–10 teeth on each margin, entire in upper part, glabrous at both sides or sparsely hairy above, minutely puberulent on the margin or on the veins beneath; inflorescence secund; flowers paired in the axils of upper leaves; pedicels 1–2.5 mm long covered with short hairs interspersed with stipitate glands; calyx 2–3 mm long, to 7 mm long in fruit, declined or nearly pendulous, densely hairy and glandular; corolla 1.6–2 cm long, lilac-blue, glandular-hairy, with slightly curved tube; anthers hairy; nutlets ellipsoid, densely papillose-tubercled, brown. June–August.

Flood plains, forests and coppices, margins of swamps. — European part: V.-Don, Transv., L. Don, L.V.; West Siberia: Ob, U. Tob., Irt.; Centr. Asia: Balkh. Endemic. Described from vicinity of Ust'-Medveditskaya station in Don region. Type in Khar'kov.

Note. This species is apparently connected with *S. hastifolia* L. through intermediate (or transgressive?) forms. In their description Taliev and Shiryayev grouped it primarily with *S. scordiifolia*, which we find an unsuitable choice.

Series 4. *Minores* Juz. — Like *Eu-galericulatae* or, more so, *Hastifoliae*, but plants usually smaller; flowers very small, ca. 5 mm long, on finally drooping pedicels.

8. **S. dependens** Maxim. Prim. fl. Amur. (1859) 219; Komarov in Tr. Bot. sada, XXV, II, 341. — *S. oldhami* Miq. in Ann. Mus. Bot. Lugd.-Bat. III (1867) 197. — *S. minor* Ldb. Fl. Ross. III, 399; Turcz. Fl. baic.-dahur. II, 419, non L. — *S. breviflora* Turcz. in sched. — **Ic.**: Sugawara, Ill. Fl. of Saghal, IV, tab. 727.

99 Perennial, with slender subfiliform rhizome and long capilliform stolons; stems 5-50 cm long, mostly erect, straight or flexuous, weak, sometimes decumbent, sulcate, glabrous, simple or branching, the branches appressed or ascending, sometimes nearly horizontally spreading, often very long; leaves 0.4-3 cm long, 0.2-1.7 cm wide, ovate, oblong-ovate to narrowly triangular, with cordate, orbicular, truncate or nearly sagittate base, obtuse at apex, entire or very often crenate in lower part, with 1-3 uneven obtuse teeth on each margin, sometimes obscurely crenate, glabrous above or with very fine short hairs only along margins and on the veins beneath, the short petioles mostly with scattered short appressed hairs; flowers solitary in the axils of nearly all leaves (except the lowermost); pedicels scabrous, longer than petioles, erect at first, later drooping; calyx ca. 1.5 mm long, pale green, prominently nerved, the margin and nerves slightly hispid; corolla small, ca. 5 mm long, twice the length of calyx, white or pale violet with blue spots, inflated at throat, pubescent outside; nutlets depressed-globose, very small, verrucose. June-August. (Plate VI, Figure 1.)

Shady forest valleys, water meadows, swamps, osier-beds along river banks, forest streams, rice fields. — East Siberia: Ang.-Say. (Irkutsk), Dau.; Far East: Ze.-Bu., Uss., Sakh. **Gen. distr.**: Jap. and Ch. Described from lower Amur, slopes of Khékhtsir Mountain (near estuary of Ussuri River). Type and paratype in Leningrad.

Note. The true West European *S. minor* L., reported for Lithuania by older authors (Gilibert, Jundzill — quoted by Ledebourg (Fl. Ross. III, 400)), does not occur in the USSR.

Series 5. *Scordiifoliae* Juz. — Like *Eu-galericulatae* or *Regelianae* but leaves foveolate-punctate beneath.

9. **S. scordiifolia** Fisch. ex Schrank in Denkschr. Bot. Ges. Regensb. — II (1822) 55; Ldb. Fl. Ross. III, 398; Kryl. Fl. Zap. Sib. IX, 2298. — *S. galericulata* δ . *scordifolia* Rgl. Tent. Fl. Ussur. (1861) 118. — *S. adamsii* auct. plur. in synonym. non Spreng. (nec Hamilt.). — *S. reptans* Pall. in herb. sec. Ldb. l. c. III, 398. — *S. depressa* Fisch. mss. ex Ldb. l. c. — *S. montana* Rudolph in herb. — **Ic.**: Komarov in Tr. Bot. sada, XXV, II, Plate IV, Figure II (non typica).

100 Perennial, with slender vertical or creeping rhizome; stems 10-30 cm long, erect, normally with declined branches from base, rarely simple, covered mainly on the ribs with short curved hairs; leaves 1-3.5 cm long, 3-8 mm wide, oblong or lanceolate, the lower wider, sometimes oblong-ovate, rounded or broadly cuneate at base, obtuse, entire or sparsely denticulate, usually glabrous above, rarely with scattered short hairs, foveolate-punctate beneath, with appressed short hairs mostly confined to margin and veins, short-petioled; inflorescence a short, lax, secund raceme; flowers solitary in the axils of, and usually exceeding, the leaves; calyx 3.5-4 mm long, short-appressed-hairy and glandular, commonly colored; corolla 18-22 mm long, violet-blue, glandular-hairy outside; lateral lobes of upper lip scarcely as long as the middle lobe; lower lip equaling or slightly

exceeding the upper, slightly emarginate; nutlets 1.5–2 mm long, largely papillose-tubercled. June–September. (Plate V, Figure 3.)

Steppe meadows, wastelands, stony slopes. — West Siberia: Ob., Irt., Alt.; East Siberia: universal; Far East: Ze.-Bu., Uss. **Gen. distr.:** Mong., Ch., Jap. Described from Siberia. Type unknown.

10. *S. taquetii* Lévl. et Vaniot in Fedde, Repert. VIII (1910) 402. — *S. scordifolia* var. *hirta* Fr. Schm. Fl. Sachal. (1868) 165. — *S. scordifolia* var. *pubescens* Miq. in Ann. Mus. Bot. Lugd.-Bat. III (1867) 197; Kom. (cit. Regl.) in Tr. Bot. sada, XXV, II, 344 (non *S. galericulata* β. *pubescens* Rgl.). — *S. scordifolia* var. *sachalinensis* Matsum. et Kudo in Bot. Mag. Tokyo, XXVII (1912) 296. — *S. scordifolia* var. *obtusifolia* Lévl. in Fedde, l. c. 280. — *S. pubescens* Loes. in Beih. Bot. Centralbl. XXXVII, II (1920) 174. — *S. schmidtii* Kudo in Journ. Coll. Sc. Univers. Tokyo, XLIII, 8 (1921) 13, saltem pro max. parte. — *S. strigillosa* Kom. in Kom. and Alis. Opređ. rast. Dal'nevost. kraya, II (1932) 899, vix Hemsl. — **Ic.:** Sugawara, Ill. Fl. of Saghal. IV, tab. 724 (nom. *S. strigillosa* Hemsl.).

Perennial; rhizome slender, subvertical or oblique, rarely creeping, yellowish, jointed, rooting at nodes; stems 7–70 cm long, erect or flexuous, usually strongly branching from base, rarely simple, mostly covered all over, rarely only on the ribs, with shortish patent crisp hairs, pale yellowish-green, often lilac-tinged, the branches flexuous, branching in turn; leaves 1–5 cm long, 0.3–2.2 cm wide, elliptic, rarely ovate or oblong, rounded or slightly subcordate at base, obtuse or rounded at apex, shallowly crenate-dentate or crenulate, with few (usually 3–7, rarely to 10) teeth on each margin, or very often all or some (especially the upper) entire, densely covered on both sides with short hairs, these straight appressed above, straight or somewhat crisp, appressed or mostly spreading beneath, the petiole short or very short; flowers in axils of upper leaves, forming a short lax secund raceme; pedicels erect or recurved; calyx 3–5 mm long, with rather long appressed or spreading hairs and, especially at base, stipitate-glandular, usually colored; corolla 2–2.5 cm long, to 1.5 cm wide at throat, covered outside with short glandular hairs; lateral lobes of upper lip shorter; lower lip usually distinctly longer than the upper; nutlets ca. 1.8 (to 2) mm long, elliptic, densely papillose-tubercled, dark brown or blackish. June. (Plate V, Figure 4.)

Seacoasts, shores of lakes and rivers (often near estuaries), mostly on sands, sandy embankments and hills, rarely on rocks, sometimes in fields. — Far East: Sakh. (Kuriles), Uda., Uss. **Gen. distr.:** Jap., Korea. Described from Korea, from Quelpart Island. Type in Paris, isotype in Leningrad.

Note. This species is sometimes reported as *S. strigillosa* Hemsl. which was described from China (Sinkiang and Shantung provinces). We have never seen the material; Hemsl.ey's brief description shows little resemblance to our plant (there is notably a significant difference in vesture). Nevertheless, the name *S. strigillosa* has priority.

11. *S. tuminensis* Nakai in Bot. Mag. Tokyo, XXXV (1921) 198. — *S. galericulata* e. *puberula* Rgl. Tent. Fl. Ussur. (1861) 119, saltem p. p.

Perennial; rhizome creeping, stout, white; stems 20–35 cm long, mostly simple or few-branched, becoming purple (especially in lower part), covered (usually sparingly) with fine

hairs and with dense bundles of longer hairs at nodes; leaves 1–5 cm long, 0.6–2 cm wide, ovate or oblong-ovate, with rounded, cordate or nearly sagittate base, acute or obtuse at apex, often serrate-dentate, with 7–12 rather high acute teeth, rather densely covered on both sides (especially the upper) with short white hairs, bright green above, pale beneath, with very prominent veins, obscurely foveolate-punctate, short-petioled or subsessile; flowers clustered at summit of stem, rather large, 1.5–2.5 cm long, solitary in the axils of sharply serrate-dentate mostly subacute or acute bracts, on rather patent-hairy pedicels 2–4 mm long; calyx 4–5 mm long, patent-hairy, with short scutellum, usually colored; corolla violet-blue, the tube hairy and glandular outside, the broad lower lip longer than the upper; anthers hairy. June–August.

Meadows, oak forests, coppices in valleys of rivers and streams, grassy and scrub-covered volcanic slopes, wastelands. — Far East: Uss. **Gen. distr.:** Ch. (Manchuria). Described from Kanto region, along Tumingan River. Type in Tokyo.

Note. A little known, critical species of which we have not seen the type. It may be one of the intermediate forms between *S. scordiifolia* and *S. taquetii* which apparently occur frequently where the distribution areas of these two species converge.

102 12. ***S. polyphylla*** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR. — XIV (1951) 359.

Perennial, 25–45 cm high; stem erect, branching from base, glabrous or short-hairy on the ribs below; branches very long, erect; leaves very many (25–30 pairs on stem and branches), approximately the length of internodes or often shorter, 1–3 cm long, 0.3–1.6 cm wide, ovate or ovate-lanceolate, gradually attenuate from broad, truncate or subcordate base, obtuse or acute at apex, with 3–10 well developed, strongly inequilateral obtuse teeth on each margin, pale green, completely glabrous on both sides, or the upper surface with scattered short hairs, the lower with isolated minute hairs sometimes confined to the veins, obscurely foveolate-punctate; petioles well developed, 3–12 mm long; flowers few, small, in the axils of remote upper leaves, on pedicels 3–5 mm long; calyx 2–3 mm long, with short patent hairs; corolla 1.4–1.7 cm long, sparingly short-hairy and glandular; nutlets ca. 1 mm wide, globose-ovoid, black, densely and finely tuberculate. July–August.

Mixed and coniferous forests in valleys, riverbanks. — Far East: Ze.-Bu., Uss. Endemic? Described from Khabarov Territory. Khekhtsir. Type (Desulavi, No. 1481) in Leningrad.

Note. We have only tentatively placed this little known species in the series *Scordiifoliae* Juz. It may perhaps prove to be related to *S. komarovii* Lévl. et Vain, which was described from Korea and which we have never seen, and may eventually join it to make up a specific series.

Series 6. *Moniliorrhizae* Juz. — Flowers large, 2–3 cm long; rhizome moniliform, consisting of white jointed tubers; leaves not foveolate-punctate beneath.

13. ***S. moniliorrhiza*** Kom. in Tr. Bot. sada, XXV, ed. II (1907) 346. — Ic.: Komarov, op. cit. Plate IV, Figure III.

Perennial; rhizome vertical or creeping, moniliform, consisting of white jointed tubers, rooting at the joints, with filiform stolons arising at the crown; stems 12–35 cm long, single, simple or with few appressed branches at base, rarely divaricately branched, more

or less white-hairy at nodes, glabrous elsewhere; leaves ovate or oblong-ovate, cordate or rounded at base, rounded at apex or sometimes acute, crenate-dentate, with 3–7
103 large obtuse teeth on each margin, glabrous or with long patent hairs above, usually glabrous beneath or with few long hairs on veins and densely and finely granular-glandular; flowers few, large, in the axils of small but always crenate-dentate upper leaves, short-pediceled; calyx ca. 3 mm long, in fruit ca. 5 mm, sparingly pubescent (usually only on nerves and margins) or subglabrous; corolla 2–3 cm long, violet-blue, with whitish tube, short-hairy and glandular outside; nutlets 1–1.5 mm long, ellipsoid, densely papillose-tubercled, brownish. June – September.

Mountain forests, stony and rocky placers, in thick grass around springs. — Far East: Uss. **Gen. distr.:** Korea. Described from N. Korea. Type and paratype in Leningrad.

Section 2. **Stachymacris** A. Hamilt. Monogr. Scutell. in Ser. Bull. Bot. V (1832) 1.— Flowers in dorsoventral verticillasters, forming terminal racemose one-sided spikes; bracts herbaceous, resembling cauline leaves but smaller, or markedly distinguished by their shape, smaller size and entire margin, but leaflike in being distinctly petioled. Perennial, often comparatively large herbs of mesophytic aspect, with sessile or long-petioled, entire or dentate leaves.

This section, like the preceding, has a holarctic type of distribution.

Note. A very heterogeneous section, usually combined with the preceding under the name *Vulgares* Benth. (in Benth. et Hook. fil. Gen. II, 1876, 1202). There is some ground for this unification inasmuch as there is no clear-cut dividing line between *Galericularia* and *Stachymacris*; thus the subsection *Angustifoliae* Benth., for example, could well be included in the section *Galericularia* if just a few slight changes were introduced in the characterization of the latter (c. f. Benth. in DC. Prodr. XII, 1848, 423). However, for the purpose of our flora, we prefer to retain the subdivision of the subgenus *Eu-scutellaria* into three sections and thus avoid further increase of heterogeneity within the sections.

Subsection 1. *Angustifoliae* Benth. in DC. Prodr. XII (1848) 423. — Bracts resembling cauline leaves but smaller, always sessile; flowers large. Erect herbs, with lanceolate or linear, entire, somewhat coriaceous, sessile or short-petioled leaves.

14. **S. baicalensis** Georgi, Bemerk. einer Reise im Russ. R. I (1775) 223; id. Beschr. Russ. R. III, 5, 1097; Ldb. Fl. Ross. III, 397. — *S. macrantha* Fisch. ex Rchb. Ic. Bot. 104 Pl. crit. V (1827) 52. — *S. speciosa* Fisch. ex Turcz. Cat. baic.-dahur. II (1838) 416. — *S. grandiflora* Adams ex Bge. Enum. pl. Chin. bor. (1831) 52. — *S. adamsii* A. Hamilt. Monogr. Scutell. (1832) 34, non Spreng. — *S. lanceolaria* Miq. ex Franchet et Sav. Enum. pl. Japon. I (1875) 377 (in syn.). — *S. tinctoria* Pall. in sched. — *S. ammaniana* Ldb. in sched. — Ic.: Amman, Stirp. rar. Ruthen. ic. et descr. tab. VI; Rchb. l. c. tab. 488, fig. 681; A. Hamilt. l. c. tab. 2, fig. 3. — Exs.: ex herb. H. Bot. Jurjev. sine No., sub nom. *S. macrantha* Fisch.

Perennial; root vertical, long, thick, fleshy, branching; stems few, 15–35 (50) cm long, slightly ascending or erect, robust, straight or flexuous, simple or branching from base,

glabrous or short-hairy (especially on ribs), green or often suffused with purple (especially in lower part); leaves 1.5–4 cm long, 1.5–13 mm wide, ovate-lanceolate to linear-lanceolate, orbicular or usually tapering at base, obtuse or acute, entire, glabrous or with short patent hairs above, ciliate on the margins, glandular-foveolate beneath, glabrous or short-hairy along midrib, firm, often subcoriaceous, often with slightly revolute margins; petioles obsolete or very short, ciliate; inflorescence a simple, one-sided, rather dense raceme, sometimes branching (especially in the Far East); flowers large, solitary in the axils of upper leaves, these slightly reduced in size, much shorter than the flowers; calyx ca. 3 mm long in flower, mostly rather densely short-hairy, long-hairy at apex, usually violet; corolla 2–2.5 cm long, blue, densely covered outside with long glandular hairs, the tube strongly dilated above, the upper lip slightly longer than the lower; nutlets small, flattened-subglobose, black, aculeolate. June–July. (Plate V, Figure 5.)

Stony and clayey dry mountain slopes, steppes, wastelands, osier beds along riverbanks. — East Siberia: Ang.-Say. (Lake Baikal), Dau.; Far East: Ze.-Bu., Uss. **Gen. distr.:** Mong., Ch., Jap. Described from Transbaikalia. Type unknown.

Economic importance. Used by the Chinese as pectoral emollient and anthelmintic remedy. In Tibet it is applied in the treatment of pneumonia, myocarditis, palpitation, acute rheumatism and as an antipyretic. It has valuable qualities as a hypotensive agent and should be introduced into medical practice in the treatment of hypertonia and functional disorders of the nervous system (see articles by E.M. Dumenova, A.S. Saratikov, A.M. Voronova and E.A. Toloknov in collection: *Novye lekarstvennye rasteniya Sibiri i ikh lechebnye preparaty*, Vol. II, Tomsk, 1946). An ornamental. Apparently a dyestuff.

- 105 Subsection 2. *Peregrinae* Boiss. Fl. or. IV (1879) 681. — Bracts differing markedly from cauline leaves, small, entire, short-petioled; flowers usually of medium size. Comparatively large herbs, with erect or rarely ascending stems and broad, frequently ovate, petiolate, crenate-dentate leaves.

Series 1. *Altissimae* Juz. — Large plants (to 1 m high), with large, strongly crenate-dentate leaves; bracts generally not longer than calyx, ovate, short-petioled; flowers partly or completely anthocyanin-colored.

15. *S. altissima* L. Sp. pl. (1753) 600; Ldb. Fl. Ross. III, 396; Shmal'g. Fl. II, 327. — *S. commutata* Guss. Fl. Sic. Prodr. II (1828) 136. — *S. peregrina* Waldst. et Kit. Ic. et descr. pl. rar. hung. II (1805) 132, non L. — *S. peregrina* var. *altissima* Fiori, Nuova Fl. anal. It. III (1900) 16. — **Ic.:** Waldst. et Kit. l. c. tab. 125; Reching. fil. in Bot. Arch. 43, tab. 1, fig. 11. — **Exs.:** Rehm. et Woloszcz. Fl. pol. No. 228; Callier, It. taur. III, No. 705.

Perennial; rhizome oblique, nodose; stems 25–100 cm long, erect, simple or with erect opposite branches, 4-angled, covered with small curved hairs, shortly stipitate-glandular above, especially in inflorescence; leaves petiolate, 4–8 cm long, 2.5–7 cm wide, ovate, with truncate or cordate base, obtuse or acuminate, with (3) 6–12 large obtuse crenate teeth on each margin, glabrous or sparsely short-hairy above, more densely and finely curved-hairy beneath (especially on the veins); bracts short-petioled, broadly ovate, acute, entire, equaling

or slightly exceeding the calyx; inflorescence spikelike, to 30 cm long; calyx curved, covered with long soft and short stipitate-glandular hairs, often more or less violet; corolla-tube geniculately curved in lower part, glandular-hairy, bluish-white, the back of the tube and upper lip violet-blue; upper lip longer than the lower; nutlets flattened-ovoid, ca. 2.5 mm long, finely verrucose, with solitary stellate 3-5-rayed hairs on the warts. May—July. (Plate VI, Figure 2.)

Open deciduous forests (especially oak), scrub, meadow slopes. — European part: V.-Kama (S. Ural), V.-Don, M. Dnp., Bl., Bes., Crim.; Caucasus: Cisc., E. and W. Transc.

Gen. distr.: Centr. Eur. (usually escaped), Med., Bal.-As. Min. Described from Georgia ("Iberia"). Type in Paris (Tournefort Herbarium).

- 106 16. *S. tournefortii* Benth. Bot. Reg. XVIII (1832) ad calcem, No. 1493; id. apud DC. Prodr. XII (1848) 419; Ldb. Fl. Ross. III, 396. — *S. altissima* var. ? corollis 4-plo majoribus C. A. M. Verzeichn. (1831) 89. — *S. altissima* var. *grandiflora* C. A. M. in sched.? — **lc.:** Reching. fil. in Bot. Arch. 43, tab. 1, fig. 19.

Perennial; stems 20–85 cm long, erect, straight or somewhat flexuous, simple or slightly branching, 4-angled, covered with fine curved hairs; leaves 2.5–8.5 cm long, 1.4–5.5 cm wide, ovate-triangular, truncate or subcordate at base, obtuse or acute, coarsely and obtusely crenate with 5–10 teeth on each margin, sparsely covered on both sides with short-appressed or close-appressed hairs, on petioles 0.5–2.5 cm long; inflorescence 7–25 cm long, racemose, 1-sided, lax, the axis covered with short curved hairs; bracts short-petioled, ovate-rhombic, acute, entire, shorter than calyx; calyx 4–5 mm long, with short patent hairs and stipitate glands, corolla 6 times the length of calyx, 1.7–2.2 cm long, purple, sparsely covered with short hairs and short stipitate glands; nutlets ca. 1 mm long, dark brown, scabrous with short papilliform hairs or warts. May–September. (Plate VI, Figure 3.)

Forests, shrubs on mountain slopes, ravines. — Caucasus: Tal. **Gen. distr.:** Iran (Hircan province). Described from Iran. Type in London (Lambert Herbarium).

Series 2. *Indicae* Juz. — Like *Altissimae* but smaller (usually to 40 cm high) and more slender; bracts lanceolate.

17. *S. ussuriensis* (Rgl.) Kudo in Kudo et Yoshimi Rep. Veg. Tomakomai Forest (1916) 53; Nakai in Bot. Mag. Tokyo, XXXV (1921) 198; Kom. and Alis. Opred. rast. Dal'nevost. kraya, II, 896. — *S. japonica* β. *ussuriensis* Rgl. Tent. Fl. Ussur. (1861) 118, p. p. (s. str.). — *S. japonica* Maxim. Prim. fl. Amur. (1859) 218 et auct. plus. Ross. p. p., non Morr. et Decne. — *S. indica* Kom. in Tr. Bot. sada, XXV, II (1907) 339 (nec alibi) p. max. parte, non L. — *S. indica* var. *japonica* auct. Ross. p. p. non Miq. — **lc.:** Kom. and Alis., op. cit. Plate 271, Figures 1–5.

Perennial; rhizome very slender, long, white, with slender underground shoots; stems 5–40 cm long, solitary, erect, straight or slightly flexuous, with few internodes, simple or rarely branching, with erect or arched or flexuous branches, 4-angled, deeply sulcate, glabrous or slightly patent-hairy (especially under the nodes), often dark purple; leaves dark
107 green, 0.8–6.5 cm long, 0.6–4.5 cm wide, orbicular, broadly ovate or ovate, with rounded,

cordate or truncate base, obtuse, coarsely and unevenly crenate with 5–12 irregular, rounded or obtusish teeth, glabrous on both sides or with sparse, frequently long, multicellular (articulate) white hairs above and on the veins beneath; petioles slightly shorter to rarely longer than blade; inflorescence racemose, terminal, erect, rather lax, mostly one-sided; floral leaves at base of inflorescence resembling upper cauline leaves but much smaller; bracts small, usually lanceolate, attenuate at both ends, petiolate, acute, entire; pedicels as long as bracts, finely pubescent; calyx green or dark violet, with few hairs; corolla 10–20 mm long, partly white, partly blue (upper lip), with arched tube; nutlets ca. 1 mm long, angled-ovoid, brownish, muricate-tubercled. June–September.

Coniferous and mixed forests, riverbanks, in the shade of trees or among shrubs, on littered soil, on rocks or decayed tree trunks. — Far East: Uss. **Gen. distr.:** Korea. Described from Ussuri River valley (estuary of Ussuri River near Turme). Type in Leningrad.

18. *S. pacifica* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 362. — *S. indica* Kom. in Kom. and Alis. Opred. rast. Dal'nevost. kraya, II (1932) 895 et auct. plur. non L. fil. — *S. japonica* Maxim. Prim. fl. Amur (1859) 218 et auct. plur. Fl. Ross. p. p. non Morr. et Decne. — *S. indica* var. *japonica* auct. Ross. p. p. non Miq. — *S. japonica* β. *ussuriensis* Rgl. Tent. fl. Ussur. (1861) 118, p. p. — ? *S. ussuriensis* var. *transitra* (sic) Nakai in Bot. Mag. Tokyo, XXXV (1921) 199, non *S. transitica* (sphalm. *transitra*) Mak.

Perennial; stems 8–35 cm long, mostly erect, with patent curved hairs at least on the ribs; leaves 0.6–5.5 cm long, 0.7–4.3 cm wide, rather profuse, bright green, paler and sometimes purple beneath (especially the lower leaves), crenate with 5–10 large teeth, covered on both sides with long multicellular hairs, always hairy on veins; upper leaves usually acute, or subacute; floral leaves usually with angled, acute or acuminate teeth; bracts slightly larger than in *S. ussuriensis* (Rgl.) Kudo, the lower often with few teeth; calyx mostly densely patent-hairy and glandular; corolla 15–18 (20) mm long; nutlets curved-ovoid, dark brown to blackish. Otherwise similar to *S. ussuriensis* (Rgl.) Kudo. June–July. (Plate VI, Figure 4.)

108 Deciduous and mixed forests, coppices. — Far East: Ze.-Bu., Uda, Uss. **Gen. distr.:** Korea. Described from Maritime Territory, Lien Ch'ih Ho River valley. Type in Leningrad.

19. *S. shikokiana* Mak. in Bot. Mag. Tokyo, VI (1892) 54 (nomen) et XVIII (1904) 44. — **Ic.:** Sugawara, Ill. Fl. of Saghal. IV, tab. 726.

Perennial; plant with long filiform underground shoots; stems 5–28 cm long, erect, simple or slightly branching, glabrous; leaves 1–5 cm long, 1–4 cm wide, triangular-ovate, with truncate or subcordate, rarely angled base, obtuse at apex, coarsely dentate, with 4–9 beveled semiovate or triangular, obtuse teeth on each margin, thin, sparsely patent-hairy or subglabrous above, glabrous, sometimes reddish beneath; petioles glabrous or patent-hairy, 0.5–3 cm long; inflorescence lax, 1–6 cm long, erect, the slender axis with scattered hairs above; bracts lanceolate to ovate-lanceolate, short-petioled or sessile, longer than pedicels, entire, very sparsely patent-hairy, the lower usually dentate; flowers small, 5–10 mm long, white or with faintly azure upper lip; pedicels much shorter than flowers, suberect-divaricate, short-hairy; calyx 1.5–2 mm long, to 3 mm in fruit, campanulate, sparsely and thinly patent-glandular and hispid; corolla with slightly curved tube, the limb

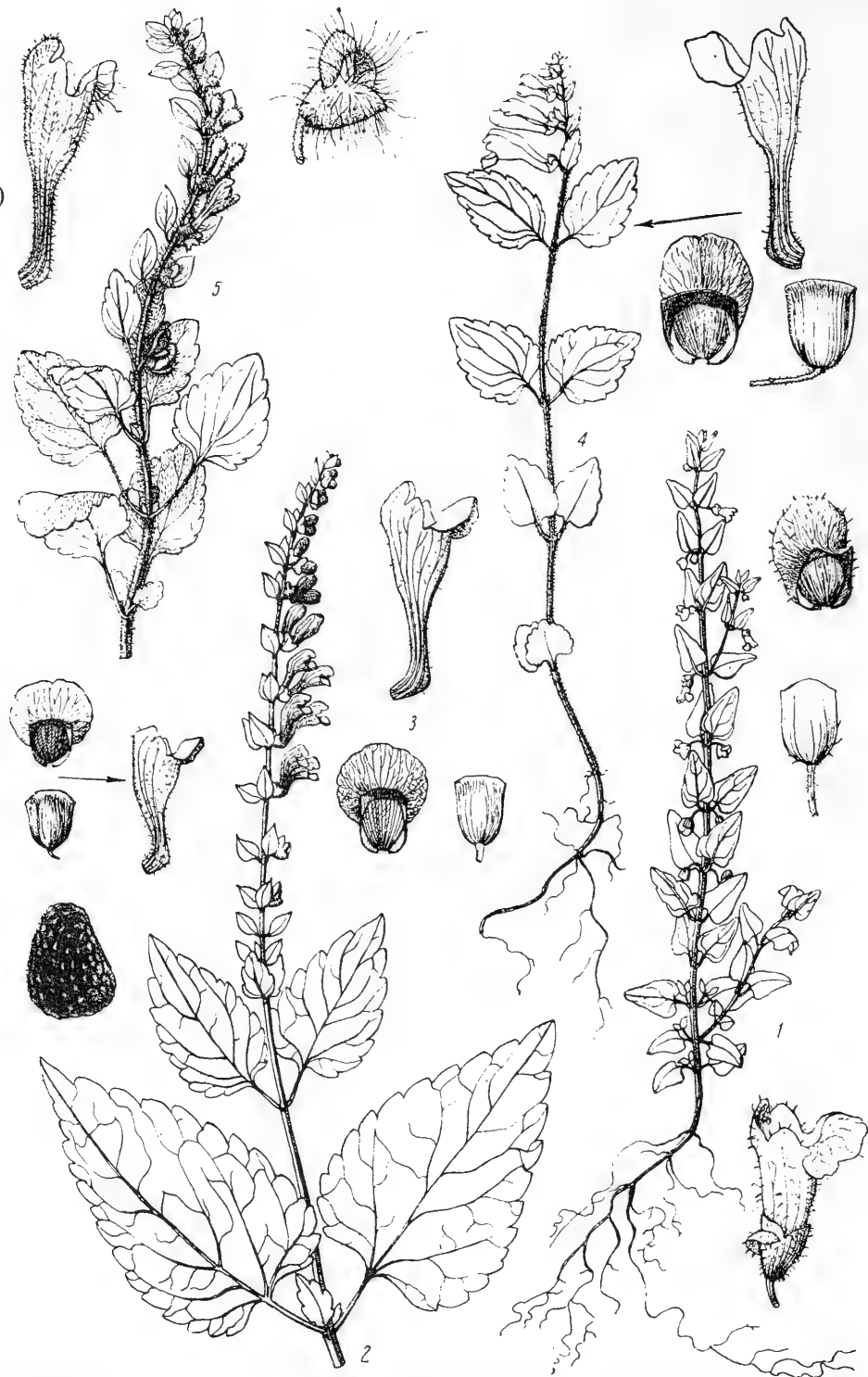


PLATE VI. 1 — *Scutellaria dependens* Maxim., general aspect, flower, upper and lower part of fruiting calyx; 2 — *S. altissima* L., summit of stem, corolla, upper and lower part of fruiting calyx, nutlet; 3 — *S. tournefortii* Benth., corolla, upper and lower part of fruiting calyx; 4 — *S. pacifica* Juz., general aspect, corolla, upper and lower part of fruiting calyx; 5 — *S. pallida* M.B., general aspect, calyx, corolla.

much shorter than the tube; lower lip larger than the upper, with small spots: lateral lobes erect, ovate-triangular, slightly shorter than the emarginate middle lobe and much shorter than the subpendulous 3-lobed lower one; nutlets ca. 1 mm long, slightly flattened, black, tuberculate. July—August.

Grassy mountain slopes. — Far East: Sakh. (S). **Gen. distr.:** Japan. Described from Kochi prefecture. Type in Tokyo.

Note. We have not been able to compare the Sakhalin plant with the type or any other material on *S. shikokiana* from Japan.

Series 3. *Albidae* Juz. — All parts slightly smaller in comparison with *Altissimae*; leaves less deeply crenate-dentate; bracts longer than calyx, long-petioled; flowers whitish or cream-colored.

- 111 20. *S. albida* L. Mant. altera (1771) 248, s. str.; Shmal'g. Fl. II, 327, saltem p. p. — *S. cretica* Mill. Gard. Dict. ed. VIII (1768) No. 2, non L. — *S. albida* ssp. *eu-albida* Reching. fil. in Bot. Arch. 43 (1941) 6. — *S. albida* var. *typica* Stoj. et Stef. Fl. Bulg. ed. 2 (1937) 854. — *S. peregrina* Ldb. Fl. Ross. III, 397, non L. — **Ic.:** Sibth. et Sm. Fl. Graeca, VI, tab. 581; Reching. fil. l. c. tab. I, fig. 23.

Perennial; rhizome creeping, flexuous, light brown; stems 23–50 cm long, erect or slightly flexuous, mostly with obliquely ascending opposite branches, obtusely 4-angled, densely covered with curved reclinate to subappressed hairs, in inflorescence with sparse long patent and very profuse long-stipitate glandular hairs; leaves 2–5 cm long, 1–4 cm wide, broadly ovate, with truncate or subcordate base (in upper leaves often broadly cuneate), each margin with 3–12 shallow, obtuse, frequently rounded teeth, both surfaces covered with fine curved hairs, the lower more densely so; petioles long, densely covered with short curved hairs; bracts long-petioled, broadly elliptic or ovate-lanceolate, rounded at apex, mucronate or acuminate, entire, mostly at least twice the length of calyx, at anthesis about equaling the flowers; inflorescence 5–16 cm long, at first contracted, later elongating but not lax; pedicels 2–3 (4) mm long; calyx 3–4 mm long, covered with few long reclinate hairs and numerous stipitate glands, in fruit 7–8 mm long; corolla to 15 mm long, whitish; nutlets depressed-globose, tuberculate, the tubercles surmounted by solitary stellate hairs. June—August.

Forests, riverbanks, stony taluses, limestone. — European part: Crim.; Caucasus: W. Transc. (Abkhazia). **Gen. distr.:** Med. (Italy), Bal.-As. Min. (Greece, Vifinia). Described from the “East.” Type in London.

Note. Reching (op. cit.) does not report this plant for the Crimea but vaguely refers the Western Caucasian (Abkhazia) plant to *S. pallida* M.B. from which, however, it differs markedly. We can find no substantial differences between our plant and the genuine *S. albida* L. whose sporadic distribution is also noted by Reching (l. c. 9). More detailed investigation of the various vicarious races will result in subdivision of the species.

21. *S. pallida* M. B. Fl. taur.-cauc. II (1808) 65. — *S. albida* Ldb. Fl. Ross. III, 397, non L.; Shmal'g. Fl. II, 327, pro max. parte. — *S. albida* ssp. *pallida* Reching. fil. in Bot. Arch. 43 (1941) 8.

- 112 Perennial; close to preceding species but leaves more deeply cordate, the dentation deeper and more acute; hairs on stems and petioles longer and straighter; leaves densely covered on both sides with longer hairs, these spreading beneath especially on the veins, stems more densely glandular-hairy (glands present here not only in inflorescence but also on upper half of sterile part of stem); bracts narrower and more acute. June–July. (Plate VI, Figure 5.)

Stony slopes and taluses, roadsides in conifer (juniper and pine) forests. — European part: Crim. Endemic. Described from the Crimea. Type in Leningrad.

Note. The two Crimean races of this series (*S. albida* and *S. pallida*) do not appear to be clearly separated from each other and are connected by intermediate (probably hybrid) forms. We know the perfectly genuine *S. pallida* only from a few localities on the southern Crimean coast (for example, Yalta and Nikita). In certain respects it recalls the Balkan-Rumanian *S. velenovskyi* Reching. fil. (*S. pichleri* Velen. non Stapf) rather than *S. albida*, but is distinguished by its exceptionally well developed glandular hairs and its large, obtuse bracts.

Series 4. *Vacillantes* Juz. — Like the preceding series but bracts with shorter petioles; flowers anthocyanin-colored.

22. *S. woronowii* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 360. — *S. peregrina* var. *sibthorpii* Woron. in Busch, Marc. et Woron. Fl. Cauc. exs. fasc. XI (1909) 8, non Boiss. et Reut. — *S. sibthorpii* Grossh. Fl. Kavk. III (1932) 287, non Halacsy nec Reching. fil. — *S. vacillans* ssp. *colchica* Reching. fil. in Bot. Arch. 43 (1941) 15. — Exs.: Fl. Cauc. exs. No. 274.

- Perennial, 20–40 cm high, with an oblique or creeping rhizome, stems erect, straight or flexuous, usually branching nearly from base or in upper part, with obliquely ascending branches, distinctly 4-angled, densely covered with short spreading hairs, often almost velutinous, occasionally with some long hairs, in inflorescence with spreading long-stipitate glands; leaves 2–4 cm long, 1.4–3 cm wide, 1½ times as long as wide, broadly ovate, subcordate or truncate at base, obtuse or acute, with 5–7 usually shallow obtuse teeth on each margin, densely covered on both sides with short spreading hairs, mostly subvelutinous beneath, the petioles densely covered with short spreading hairs; inflorescence 7–15 cm
113 long, lax; bracts short-petioled, ovate to ovate-lanceolate, acute, entire, as long as or slightly longer than calyx, at anthesis much shorter than corolla, densely long-hairy on both sides; calyx 3–4 mm long, to 6 mm in fruit, with long patent hairs and stipitate glands; corolla 1.4–1.7 cm long, dingy mauve; nutlets covered with stellate hairs. June.

Stony places among shrubs. — European part (?): Crim. (see Note); Caucasus: W. Transc. (rarely). **Gen. distr.:** As. Min. (Artvin, Trabzon). Described from former Artvin district, Svetibar village near Artvin. Type in Leningrad, isotypes (Fl. Cauc. exs. No. 274) in many herbaria.

Note. Zefirov identified with this species the Crimean plant referred by Syreishchikov (no doubt erroneously) to *S. columnae* All. We have not so far had an opportunity of studying Syreishchikov's plant.

Subsection 3. *Salviifoliae* Boiss. Fl. or. IV (1879) 681. — Bracts entire, smaller than cauline leaves. Low prostrate herbs, with obscurely crenate or entire leaves.

Series 5. *Ponticae* Juz. — Flowers purple or violet; leaves not rugose (as opposed to the Eastern Mediterranean series *Eu-salviifoliae* Juz. with yellow flowers and conspicuously rugose leaves).

23. **S. pontica** C. Koch in Linnaea, XXI (1848) 701; Boiss. Fl. or. IV (1879) 686.

Low herbaceous perennial, with numerous slender procumbent and rooting glabrous brownish or dingy-violet caudices; flowering shoots 4–12 cm long, ascending at base, simple, often lilac, covered with very short (sometimes longer at the angles) recurved white hairs, in inflorescence with long spreading hairs and short stipitate glands, mostly with very short internodes and hence densely leafy; leaves small, obovate, 8–14 mm long, 4–9 mm wide, rounded or subcuneate at base, obtuse, obscurely and remotely crenate with 1–6 crenations on each margin, sometimes almost entire, glabrous or short- or rather long-ciliate on the margins below; petioles to 14 mm long, covered with short curved reclinate hairs; uppermost leaves short-petioled or sessile; bracts sessile, 3–8 mm long, 2–4 mm wide, elliptic to narrowly ovate, entire, longer than calyx but much shorter than corolla, ciliate on the margin, covered in lower part with long, and in upper part with short hairs; flowers few, opposite, crowded in short one-sided loose raceme 2.5–5 cm long; calyx ca. 3 mm long, covered with short-stipitate glands and few long coarse white hairs; corolla 2.2–2.5 cm long, short-stipitate glandular and sparingly pubescent outside, the tube scabrous, curved at base, ca. 5 mm wide at throat, lips approximately equal, purple-violet. June–July.

Stony places and pastures in the alpine belt. — Caucasus: W. Transc. (Adzharia, mountains Khino and Trial). **Gen. distr.:** Bal.-As. Min. (Lazistan). Described from “Pontus Lazicus.” Type was in Berlin.

24. **S. helenae** Alb. in Otch. and Tr. Odessk. otd. Ross. obshch. sadov. 1890 (1891) 14. — *S. pontica* β . *abchasica* Alb. in Bull. Herb. Boiss. (1893) 261. — **lc.:** Alb. l. c. (1891) tab. (sine No.); Kolakovskii, Fl. Abkhaz. IV, Plate V.

Perennial; caudex semiligneous, rather slender, prostrate, branching, subglabrous, jointed, grayish-brown; leafy branches 5–12 cm high, rather slender, ascending, simple, usually turning lilac, covered with short spreading recurved hairs, these interspersed above with stipitate glands; leaves rather distant, often much shorter than internodes, 6–20 mm long, 3–12 mm wide, larger than in *S. pontica*, ovate or elliptic, truncate or often subcuneate at base, obtuse, with scattered short appressed hairs above, diffusely patent-hairy on the veins beneath, the margin with few obscure crenations, long-ciliate; lower petioles 5–17 mm long, covered with long spreading hairs; inflorescence a short lax to fairly dense one-sided raceme 3–5 cm long; bracts 5–10 mm long, 2.5–5 mm wide, on distinct slender petioles 1–2 mm long, herbaceous, narrowly elliptic, longer than calyx (including pedicel), with scattered hairs on upper surface, densely long-ciliate at margins, glandular-punctate beneath, the midrib rather densely covered with long spreading hairs; calyx ca. 2–3 mm long with pedicel 1–1.5 mm, both densely hispid and stipitate-glandular; corolla 1.5–2.5 cm long, purple, hairy and glandular outside, the tube slightly curved at base. July–August.

Rocks, stony places in the alpine belt, alpine ranges. - Caucasus: W. Transe. (Abkhazia, Lesser Adzharia, Karchkhal Mountain). Endemic. Described from Vzyb Range (Chipshir Mountain) in Abkhazia. Type (or isotype) in Leningrad.

- 115 Section 3. **Nevskianthe** Juz. Flowers opposite in axils of ordinary leaves, turned in different directions or aggregated in small axillary capitate few-flowered inflorescences and then bracts leaflike but much smaller. Xeromorphic subshrub, with numerous erect virgate stems; leaves small, entire or slightly dentate, short-petioled; stems and leaves covered with short hairs. A Central Asian oligotypic group.

Note. Species of this group were connected by the authors concerned with *S. multicaulis* Boiss. This was clearly a mistaken approach since, notwithstanding a certain superficial resemblance to that plant, they do not fit at all into the section *Lupulinaria*, to which *S. multicaulis* is commonly referred on account of undifferentiated leaves. Absence of the characteristic one-sided inflorescence, not to mention differences of habitat, should preclude inclusion of these species in any of the preceding sections.

Series 1. *Colpodeae* Juz. - Scutellum small, concave, perpendicular to upper calyx lip; leaves entire.

25. ***S. colpodea*** Nevski in Tr. Bot. inst. AN SSSR, 1, 4 (1937) 322.

Subshrub with a stout woody caudex; stems many, 35-50 cm long, slightly woody at base, erect, slightly flexuous, obscurely 4-angled to subcylindric, velutinous with very short hairs, strongly branching; lower leaves 1-1.5 cm long, 4.5-9 mm wide, ovate, obtuse, cuneate at base and tapering to short petiole; upper leaves and bracts smaller, 2-9 mm long, 1-4.5 mm wide, ovate-lanceolate, obtuse, reclinate; all leaves grayish-green, puberulent (especially beneath), entire, thickish; flowers solitary in axils of bracts, forming a very loose inflorescence; pedicels very short, reaching 2.5 mm in fruit, erect, pubescent; calyx ca. 2 mm long, short-tomentose, accrescent to 3-3.5 mm; scutellum on upper lip 1.7-2 mm long, 1.3 mm wide, oblong-tetragonal, scarcely attenuate at apex, notched and obtusely 2-toothed; lower lip orbicular-obovate, very obtuse, ca. 2.5 mm across, persistent; corolla 1.8-2.3 cm long, brownish-purple, densely hairy outside, with a dingy yellow spot on lower lip, the very slender purple-yellow tube slightly curved at base, ca. 1 mm thick, nutlets grayish-blackish, sparingly pubescent. July.

- 116 Dry gypseous hills. - Centr. Asia: Pam.-Al. (Kugitang). Endemic. Described from foothills of Kugitang Mountain near the village of Kugitang. Type in Leningrad.

26. ***S. striatella*** Gontsch. in Tr. Bot. inst. AN SSSR, 1, 1 (1933) 172.

Subshrub; caudex thick, woody, to 3 cm across, covered with brown bark, branching; branches 2-4 cm long, stoutish, erect or ascending; annotinous stems of two kinds, sterile and flowering, numerous, erect or ascending, slenderly virgate, obscurely 4-angled, branching in lower part, very densely gray-tomentose, with distant leaves; flowering stems (27) 32-40 cm long, to 1.5-2 mm across in lower part; lower leaves 8-12 mm long, 4-6 mm wide, rhombic-oblong-ovate, rarely ovate-lanceolate, cuneate at base, obtuse at apex, on

petioles 3–4 mm long; upper leaves smaller, ovate-lanceolate, gradually tapering to very short petiole; all leaves entire, slightly revolute-margined, with very short hairs above, canescent-tomentulose beneath, thickish; inflorescences short, spicate to subcapitate, 3–7-flowered, axillary, paired, on short peduncles or sessile, forming an interrupted compound inflorescence, this (14) 18–26 cm long, consisting of 5–7 (9) very distant pairs of spicules; bracts small, ca. 4 mm long, obovate, frequently long-white-villous; pedicels very short; calyx 1–1.5 mm long, densely villous; scutellum 1 mm long, to 3 mm in fruit, slightly emarginate, with very short hairs; corolla ca. 2.4 cm long, pale yellow or cream-colored, the inside and the lateral lobes of upper lip purple, the lower lip purple or yellow, the tube purple-streaked on the nerves inside, hairy outside; nutlets ca. 1 mm long, blackish-purple, minutely puberulent. August. (Plate VII, Figure 1.)

Stony slopes. — Centr. Asia: Pam.-Al. (Tadjikistan). Endemic. Described from Kara Tau Mountain at right bank of Vakhsh River north of Kurgan-Tepe near Zarangbulak, 11 km north of Khodzha-Mastan Mountain. Type in Leningrad.

Series 2. *Cristatae* Juz. — Scutellum large, ca. 1 cm wide, flat, forming a winglike extension of the upper lip; leaves finely sinuate-dentate.

27. *S. cristata* M. Pop. in Bot. mat. gerb. Gl. bot. sada RSFSR, V, 10 (1924) 155. — *S. reniformis* Gontsch. et Zapr. in Izv. Tadjiksk. bazy AN SSSR, I, 1 (1933) 74. — Ic.: Gontsch. et Zapr. l. c.

- 117 Perennial; caudex rather robust, crooked, strongly branching, covered with peeling brownish-gray bark; stems ca. 30 cm long, numerous, woody in lower part; branches few, opposite, slender, virgate, faintly 4-angled, grayish with profuse short slightly reclinate hairs; leaves 1–1.3 cm long, 0.9–1 cm wide, remote, much shorter than internodes, ovate-orbicular, rounded at base or cuneately tapering to petiole, apically rounded, obtuse, sparsely denticulate, prominently veined beneath, covered on both sides with short or very short hairs, grayish with denser pubescence beneath, short-petioled; upper leaves and bracts gradually but strongly decreasing in size, the uppermost almost entire; inflorescence loose, elongate (at least in fruit); bracts herbaceous, resembling cauline leaves (see above); flowers 1–2 in axils of leaves, 1.2–1.3 cm long; calyx small at flowering, sparsely tomentose, the lips rounded-ovate, ca. 2 mm long, to 2.5 mm in fruit; scutellum narrow at first (1 mm), expanding into a large, reniform, coriaceous, nerved crest, 5–6 mm long, 8.5–10 mm wide; corolla ca. 1 cm long, greatly exceeding the calyx, brownish-green, with yellow lower lip, pubescent outside the tube ca. 1 mm wide at base, to 2.5 mm long to throat, the upper lip obtuse, ca. 3 mm long, the lower lip ca. 2.5 mm long, broadly ovate; nutlets nearly globose or slightly oblong, brownish, smooth, sparingly pubescent. June–July. (Plate VII, Figure 2.)

Conglomerate rocks, outcrops of red clays, red sand ravines, sandstone detritus. Centr. Asia: Pam.-Al. (S. Tadjikistan). Endemic. Described from Bal'dzhuan, rocks along Kizyl-Su River. Type in Tashkent.

Note. We have not seen the type of *S. cristata* but, on the basis of its description, we have referred to it the plant collected by Zapryagaev and Tekut'ev and described in Zapryagaev's article "Novinki flory Tadjikistana" (Novelties in the Flora of Tadjikistan); it

was also collected in the Shuroabad area by Linchevskii and Maslennikov. Following a study of this material, we have made some additions to Popov's description of *S. cristata*.

Section 4. **Lupulinaria** A. Hamilt. in Mém. Soc. Linn. Lyon, I (1832) 11. — *Spicatae* Benth. in Bot. Reg. 18 (1832) ad calcem, No. 1493. — Flowers usually in more or less approximate, rarely distant, verticillasters; inflorescences usually terminal, 4-angled, spicate or rarely subracemose, not one-sided, at most obscurely dorsiventral; bracts usually
118 scarious, conspicuously differing from cauline leaves in shape, consistency, color and vesture, always sessile. Perennials or subshrubs, sometimes shrubs, with petiolate, mostly crenate-dentate or deeply dissected leaves. More or less xerophytic, rarely mesophytic, alpine plants.

The largest section of the genus; indigenous to the Eastern Mediterranean, in particular to countries lying east of the region (the so-called "Ancient Mediterranean"). Only one subsection, *Alpinae*, penetrates into the Euro-Siberian holarctic subregion.

Subsection 1. *Fruticulosae* Juz. — Subshrubs, with numerous, usually virgate stems; leaves slightly tomentose beneath or green on both sides; inflorescence spikelike, interrupted, the verticillasters (especially the lower) remote; bracts varying in shape (see characteristics of series) and in this respect similar to the bracts of *Orientalis* Juz. An Irano-Turanian group.

Series 1. *Naviculares* Juz. — Bracts subherbaceous, ovate-lanceolate, acute, navicular, with prominent keel, sparsely tomentose, eglandular.

28. ***S. navicularis*** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 377.

Many-stemmed subshrub branching from base, 17–35 cm high; root long, woody, flexuous, branching; perennial shoots woody, to 3 mm in diameter, covered with brownish bark, producing short sterile shoots and much longer fertile ones; fertile shoots many, to 1 mm in diameter, subterete, tough, with a sparse pruinose cover of very fine hairs, gradually passing above into inflorescence; leaves distant, much shorter than internodes (sometimes half as long), 0.7–2 cm long, 0.3–1.2 cm wide, ovate or the upper narrowly ovate, truncate or obtusely angled at base, obtuse or acute at apex, deeply or above shallowly and unevenly crenate with (0) 1–5 teeth on each margin, often apically entire, bright green, glabrous above, glaucescent beneath, with faint appressed tomentum of minute fine hairs, the veins indistinct, scarcely prominent beneath; petioles 0.1–1 cm long, with bloomlike pubescence on the underside; flowers solitary in the axils of bracts; inflorescence 3.5–6 cm long, lax, the distance between pairs of flowers 0.7–1.5 cm, the vesture of the axis like that of the stems; bracts about twice the length of calyx (including pedicel), much
119 shorter than flowers, 0.6–1 cm long, expanded 2.5–4 mm wide, ovate-lanceolate, acute, navicular, entire, sparsely and finely appressed-tomentose, glaucescent; pedicels ca. 1–2 mm long, calyx 2–3 mm long, finely appressed-hairy, whitish; scutellum ovate, in fruit to 6 mm long, broadly ovate, subglabrous; corolla ca. 2.5 cm long, covered outside with

sparse, very short hairs and short-stipitate glands, the tube strongly curved at base, 1.5 mm in diameter, rapidly expanding above and to 1 cm wide at throat, the upper lip ca. 9 mm, the lower ca. 7 mm long; nutlets 1.5 mm long, brown, scarcely pubescent. June–August. (Plate VII, Figure 3.)

Sands, sand and loess slopes. — Centr. Asia: Balkh. Endemic. Described from an area between Karatal River and Uch-Kul' lakes (ravine and spring at Turanglyk). Type in Leningrad.

Note. Originally we referred this plant to group *Oxystegiae* Juz., subsection *Orientales* Juz. (on account of the similarity of the bracts), but we find it more appropriate to include it in the subsection *Fruticosae*. Among the species of this section known to us, most closely comparable would be the Iranian *S. nepetifolia* Benth. and, possibly, *S. fruticosa* Desf.

29. ***S. chenopodiifolia*** Juz. sp. nov. in Addenda XIX, 344.

Subshrub; shoots of the preceding year persistent, woody, very strong; annotinous shoots 20–35 cm long, pale green with a yellowish tint; leaves 1–2.5 cm long, 0.5–1.5 cm wide, ovate to broadly ovate, obtuse, shallowly and coarsely crenate-dentate or the upper almost entire, thickish, green on both sides, subglabrous above, covered beneath with scattered fine papilliform hairs; bracts ovate, the lower obtuse, nearly flat, the upper short-acuminate, navicular, very sparingly short-tomentose, pale green; calyx pale green in fruit, not turning red; corolla up to 2 cm long, yellow. Otherwise resembling the preceding species. June.

Sands. — Centr. Asia: Balkh. Endemic. Described from the left bank of Kurtu River between Sary-Kemir and Karasu. Type in Tashkent.

Series 2. *Multicaules* Juz. — Bracts scarious, ovate or broadly ovate, obtuse or acuminate, nearly flat, covered with simple or glandular hairs.

Southwest Asian and partly Central Asian group.

30. ***S. juzepczuki*** Gontsch. in Bot. mat. gerb. Bot. inst. AN SSSR, VII, 5 (1938) 105.

120 Strongly branching many-stemmed subshrub ca. 30 cm high; perennial shoots (ramifications of caudex) woody, long, ascending or suberect, to 3 mm in diameter, covered with brown bark, producing short sterile shoots and long flowering ones; fertile shoots many, slender, 1–1.5 mm in diameter, 4-angled, covered with very fine short crisp hairs, gradually passing above into interrupted inflorescence; leaves remote, 13–17 mm long, 9–10 (11) mm wide, much shorter than internodes, ovate to subrhombic-ovate, rounded or angled at base, obtuse at apex, deeply and unevenly dentate with 3–6 teeth on each margin, green, subglabrous above, glaucescent with short appressed hairs beneath, the veins impressed above, prominent beneath, the petioles ca. 3–4 mm long; flowers solitary in axils of bracts; inflorescence spikelike, short, loose, 14–18-flowered, 6–8 cm long, rather dense at onset of flowering, becoming interrupted, the pairs of flowers ca. 1 cm apart; axis of inflorescence covered with spreading white hairs interspersed with stipitate glands; bracts shorter than flowers, to 1 cm long, 8 mm wide, sessile, ovate to broadly ovate, acuminate, the lower crenulate, green, the upper entire, purple-green, all sparsely covered with longer simple

white spreading and shorter glandular hairs; pedicels ca. 3 mm long, pubescent; calyx (not including scutellum) ca. 2 mm long, short-villous; scutellum 2 mm long, 3 mm wide, round, slightly pubescent; corolla bright yellow, ca. 2.8 cm long, the tube ca. 1–1.6 mm in diameter, curved at base, dilating from about the middle to throat, the upper lip ca. 7 mm long, dingy green at apex, the lower ca. 5 mm long, copiously glandular outside. June.

Scrub in the rosarium belt (altitude ca. 2100 m). — Centr. Asia: Pam.-Al. (Sanglak Range). Endemic. Described from Pekhe, a village on the crest of Sanglak Range. Type in Leningrad.

31. **S. litwinowii** Bornm. et Sint. in Sintenis, It. transcasp.-pers. 1900–1901, No. 1726 (nomen seminudum); O. and B. Fedch. Perech. rast. Turk. V (1913) 160 (nomen); Bornm. in Russk. Bot. zhurn. 1 (1914) 8. Exs.: Sintenis, l. c. No. 1726.

Subshrub, persistent old woody shoots (ramifications of caudex) erect, stout, covered with grayish bark; herbaceous stems many, 17–25 cm long, simple or slightly branching, stoutish, densely covered with short fine hairs, in inflorescence velutinous with spreading glandular hairs; leaves commonly in 3 or 4 remote pairs, 0.3–2 cm long, 0.3–1.2 cm wide, one-third to half the length of internodes, ovate, truncate at base, obtuse, shallowly crenate with 2–6 teeth on each margin, sometimes almost entire, green, sparsely covered with short hairs above, glaucous, heavily pubescent and densely beset with small sessile glands beneath, prominently veined, on petioles 1–3 mm long, the uppermost sessile; inflorescence 6–12 cm long, rather dense, with verticillasters 1–2.5 cm apart; flowers solitary in the axils of bracts, these slightly wider than cauline leaves, 0.6–1 cm long, 0.5–0.9 cm wide, much shorter than the flowers, broadly ovate or suborbicular, subacute or subacuminate, entire, green or sporadically dull purple, somewhat scarious, short-hairy and glandular; pedicels very short, hairy; calyx ca. 2 mm long, densely covered with rather short spreading hairs and glands, strongly accrescent in fruit; scutellum strongly enlarging, to 8 mm long and 1 cm wide, rounded, emarginate-crenate, often reddish, sparingly pubescent; corolla 2–3 cm long, yellow, covered outside with spreading hairs and scattered short-stipitate glands, the tube curved at base, 1–1.3 mm in diameter, gradually broadening to limb ca. 1 cm in diameter, the upper lip ca. 6 mm long, the lower lip ca. 4 mm, dark brownish-purple. April–May. (Plate VII, Figure 4.)

Sandy hills. — Centr. Asia: Mtn. Turkm. Endemic? Described from Kizil-Arvat, Karakal near Kutenak. Isotype in Leningrad.

32. **S. luteo-coerulea** Bornm. et Sint. in Sintenis, It. transcasp.-pers. 1900–1901 (1903) No. 948 (nomen seminudum); Bornm. in Russk. Bot. zhurn. 1 (1914) 7. - Exs.: Sintenis, l. c. No. 948.

Subshrub, with short, erect or slightly ascending, persistent, slender, virgate, woody, strongly branching, brownish shoots; herbaceous stems (or branches) numerous, 20–40 cm long, simple or branching, rather slender, very finely and densely short-hairy, in inflorescence with longer hairs and stipitate glands; leaves many, 0.5–2 cm long, 1–5 mm wide, $\frac{1}{2}$ to $\frac{3}{4}$ the length of internodes, oblong-lanceolate, cuneately tapering to petiole, subacute, with 2–5 acutish teeth on each margin, dull, sparsely covered on both sides (more densely beneath), with short hairs and short-stipitate glands, the veins strongly impressed above, prominent beneath; petioles 0.2–1 cm long, finely pubescent or glandular; inflorescence

6-15 cm long, loose, the verticillasters to 3 cm apart; bracts 4-7 mm long, 3-5 mm wide, ovate, entire, tapering to a short point, green, somewhat scarious, patent-hairy, densely stipitate-glandular; pedicels very short or flowers subsessile; calyx ca. 2 mm long, densely
122 patent-hairy and glandular, slightly enlarging in fruit (approximately twofold); scutellum ca. 2 mm long, 3 mm wide, deeply furrowed, remotely crenate, usually becoming reddish, sparingly pubescent; corolla 1.8-2.4 cm long, patent-hairy and sparsely stipitate-glandular outside, the tube slender (ca. 1 mm in diameter at base), curved, gradually dilating above, the limb to 5 mm in diameter, yellow, the lower lip bright blue. June-July.

Mountain slopes. — Centr. Asia: Mtn. Turkm. (Kopet Dagh). Endemic. Described from vicinity of Ashkhabad. Isotype in Leningrad.

Subsection 2. *Ramosissimae* Juz. — Subshrubs, in habit like *Fruticosae* but generally with more numerous stems; inflorescences terminal, small, dense, 4-angled, spicate to subcapitate; bracts scarious, usually ovate, carinate.

Note. We have only provisionally placed this unique group alongside *Fruticosae*, with which it has always been associated (its leading species has even been accepted as a variety of *S. multicaulis*). It should be noted that the flowers of the species included here show greater similarity to those described for the preceding section, notably to the flowers of *S. colpodea* Nevski, than to those of *Fruticosae* and other *Lupulinaria*. Their inflorescences also suggest more affinity with *S. striatella* Gontsch. of the same section (i.e. *Nevskianthe* Juz.) than with *Lupulinaria*. The species of the *Ramosissimae* group should perhaps be excluded from *Lupulinaria* to which they have so far been referred on purely formal grounds.

All the known species of this subsection are very closely interrelated; they vicariate geographically and form one natural series.

33. *S. ramosissima* M. Pop. in Bot. mat. gerb. Bot. sada, V, 10 (1924) 155. — *S. multicaulis* γ. *glabrescens* Rgl. in Tr. Bot. sada, VI, II (1880) 365. — Exs.: HFAM, No. 203.

Subshrubs, caudex woody, strongly branching, the ramifications long, usually flexuous, covered with light brown bark, procumbent or ascending; stems numerous, up to 100
123 (hence plant very bushy), 20-50 cm long, slender, virgate, erect, simple or often opposite-branched, the branches slender, obliquely ascending, blackish-lilac, 4-angled, slightly short-hairy in lower part, glabrous above, softly short-hairy under the inflorescence; leaves small, 5-20 mm long, lanceolate, acute or acuminate, the lower unevenly and acutely incised-dentate, tapering to short petiole, the upper entire, sessile, glabrous or at base sparingly pubescent; inflorescences many, at ends of stems and branches, 4-angled, 1-2 cm long (not including flowers), dense, spicate to subcapitate; bracts 5-10 mm long, ovate or oblong, navicular, tapering at base, acute, scarious, with prominent longitudinal nerves, densely patent-hairy and glandular, sometimes becoming purple; calyx short-pedicel, appressed to axis of inflorescence, small, ca. 3 mm long, the lower lip short-hairy, the upper hairy and glandular, with small hairy scutellum; corolla rather large, 2-2.5 cm long, purplish-vinaceous, with yellowish tube and a small white spot on lower lip, glandular-hairy outside; nutlets 1.25 mm long, gray, finely appressed-hairy. July-September. (Plate VII, Figure 5.)

Stony places in subalpine mountain belt. — Centr. Asia: T. Sh. (W.). Endemic. Described from Khumson along Ugamu River. Type in Tashkent.

34. **S. intermedia** M. Pop. in Byull. Sr.-Az. Gos. univ. XII, dop. (1926) 16. — Exs.: HFAM, No. 201.

Subshrubs; caudex woody, strongly branching, nodose, its ramifications subimplexed, slender, flexuous, procumbent, covered with grayish-brown bark; stems many, 10–30 cm long, slender, virgate, erect, opposite-branched, densely covered with very short curved appressed hairs, apparently grayish-pruinose, with slender ascending or spreading branches nearly from base, almost leafless in upper part; leaves small, the lower and middle 0.8–1.2 cm long, 6–8 mm wide, ovate or oblong, rounded or cuneate at base, acute, crenate-dentate with few teeth (usually 3–4 per margin), sparsely covered with fine short curved appressed hairs, with strongly impressed veins above, seemingly plicate, short-petioled; uppermost leaves much reduced, sessile, subentire; inflorescences many, at ends of stems and branches, 0.8–1.5 mm long (not including flowers), capitate; bracts small, 4–6 mm long, ovate, acuminate, herbaceous, resembling uppermost leaves, densely covered with stipitate glands interspersed with longer coarser hairs; calyx short-pedicelated, 1 mm long, densely glandular-hairy, hairy above, with small scutellum; corolla 1.5–2 cm long, pubescent, with yellow tube and vinaceous-purple lips; nutlets 1 mm long, grayish with small stellate hairs. June.

Pebbles at foot of mountains. — Centr. Asia: Syr D. (Mogol Tau), Endemic. Described from vicinity of Katar-Bulak. Type in Tashkent, isotypes in Leningrad and other places.

124 35. **S. glabrata** Vved. nom. nov. — *S. multicaulis* β . *patens* Rgl. in Tr. Bot. sada, VI, II (1880) 365. — *S. intermedia* var. *glabriuscula* M. Pop. in M. Popov and N. Androsov. Rasteniya zapovedn. Guralash i Zaaminskogo lesnich. (1936) 34.

Perennial, similar to *S. intermedia* but stems with longer, more spreading branches; stems and leaves bright green, glabrous or sparingly pubescent, the vestiture including isolated longer hairs; corolla more intensely colored, both tube and limb slightly wider than in *S. intermedia*. June–August.

Dry gravelly slopes. — Centr. Asia: Pam.-Al. (Turkestan Range, Zeravshan). Endemic. Described from Guralash forest reserve. Type in Tashkent

36. **S. squarrosa** Nevski in Tr. Bot. inst. ANSSSR, I, 4 (1937) 324.

Subshrub, densely caespitose or pulvinate; caudex stout, woody, strongly branching, covered with brownish bark, the branches flexuous, crowded, subimplexed; annotinous stems 7.5–10 cm long, very numerous, obscurely 4-angled, erect, simple or rarely slightly branching, densely covered with very short and soft spreading hairs, light grayish-green; leaves (4) 5–9 mm long, (1.75) 3–6 mm wide, suberect to spreading, ovate or ovate-lanceolate, obtuse, sparsely and shallowly crenate-dentate, slightly deflexed, appressed-tomentulose above, patent-tomentulose beneath, grayish-green, thickish, short-petioled or (the upper) subsessile; flowers few, aggregated in 2's–4's in short depauperate terminal spicules 0.5–1.2 cm long (not including flowers); bracts 3–4 mm long, to 3 mm wide, ovate, acute, entire, distinctly keeled, densely patent-hairy and stipitate-glandular, commonly purple; pedicels very short, erect, to 2 mm long after flowering, hairy; calyx ca. 2 mm long, later

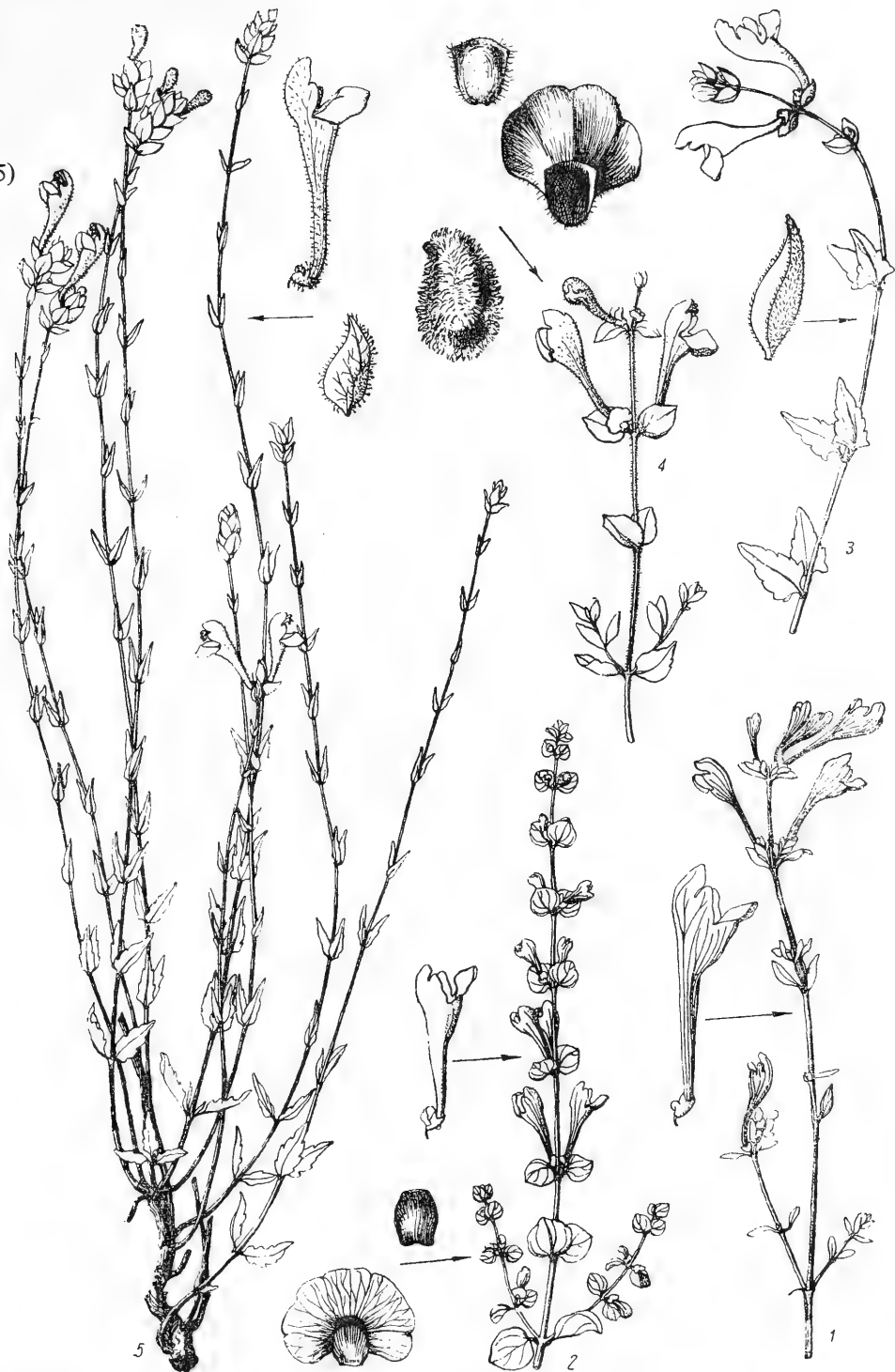


PLATE VII. 1 — *Scutellaria striatella* Gontsch., summit of stem, flower; 2 — *S. cristata* M. Pop., summit of stem, flower, upper and lower part of fruiting calyx; 3 — *S. navicularis* Juz., summit of stem, upper and lower part of fruiting calyx, nutlet; 5 — *S. ramosissima* M. Pop., general aspect, bract, flower.

slightly accrescent, the upper lip with long glandular hairs, dorsally rounded-galeate, the lower lip very obtuse, almost eglandular; corolla 1.8–2.3 cm long, purple, the tube yellow
127 beneath, ca. 1.5 mm wide, nearly straight, with purple spots at throat; lower lip with yellow spot. July.

Upper limit of Central Asian juniper zone. — Centr. Asia: Pam.-Al. (Kugitang). Endemic. Described from Kugitang Mountains above Kugitang village. Type in Leningrad.

Note. In 1932, Massagetov and Masal'skii collected in Uzbekistan (Tatar-Kishlak, mountains south of the village) a plant very similar to *S. squarrosa*, but differing slightly in the longer, arachnoid vesture of the stems (especially in their lower part), petioles and underside of leaves. We have named it *S. arachnoidea* Juz., but the material required for reliable substantiation and description of this species is obviously lacking.

Subsection 3. *Orientales* Juz. in Bot. zhurn. SSSR, 24, No. 5–6 (1939) 432; Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 377. — Subshrubs or perennial herbs; leaves with white or gray tomentum beneath; flowers in spikelike uninterrupted inflorescence, bracts varying in shape, subherbaceous or scarious; corolla-tube rather long, very slender in lower part, gradually enlarging above; lower lip of corolla frequently longer than the upper.

Group 1. *Oxystegiae* Juz. in Bot. zhurn. SSSR, 24, Nos. 5–6 (1939) 434 (pro serie). — Bracts rather narrow, generally lanceolate or ovate-lanceolate, rarely ovate, very often more or less strongly incurved, conduplicate, navicular or at least distinctly keeled, often gradually tapering above to a longish point, usually tomentose without admixture of long hairs or glands, only very rarely long-hairy at margins (see characteristics of series *Mesostegiae* Juz.).

Note. When first publishing the characteristics of this group, we conceived it, as well as the group *Platystegiae* (see below), as a series. Grossgeim promoted them to the rank of subsections. While assuming that they differ in derivation and that the subsection *Orientales* (corresponding to “*S. orientalis*” of earlier authors sensu latissimo) is apparently not monophyletic, we must emphasize that, for all practical purposes, it is very difficult, if not impossible, to establish a dividing line between these two groups. There is a certain number of well-defined forms (most of them presented below) which, in our opinion, are distinctly hybrid in origin; their inclusion in one or the other of these groups is quite arbitrary and provisional. Under the circumstances, we are obliged to retain the group *Orientales* and we are not in a position to raise the groups *Oxystegiae* and *Platystegiae* to higher status.

While agreeing in principle with Grossgeim's division of *Oxystegiae* into more narrow
128 ly conceived series, we find it possible to accept only two of the three series that he proposed for the Crimean-Caucasian forms; to these we have added three Siberian-Central Asian series.

Series 1. *Araxenses* Grossh. in Izv. Azerb. fil. AN SSSR, 3 (1945) 79. — Subshrubs;

stems woody in lower part, erect, virgate; leaves oblong or lanceolate, cuneately tapering at base, the petiole less than half as long as the blade. Southwest Asian species.

37. *S. araxensis* Grossh. in Beih. z. Bot. Zentralbl. XLIV, 2 (1928) 233. — *S. orientalis* var. *chamaedryfolia* N. Pop. in Mat. fl. Kavk. IV, 3 (1916) 73, p. p. non Rechb. — **Ic.:** Grossg. in Izv. Azerb. fil. AN SSSR, 3, 83, Figure 1.

Subshrub 14–40 cm high; caudex ascending or erect, branching; leafy shoots (stems) many, ascending at base, then erect or curved, virgate, simple or branching, rather densely short-tomentose, grayish, often faintly lilac, remotely leafy, the internodes as long as leaves or 2–4 times as long; leaves 0.8–2.4 cm long, 3–10 mm wide, oblong or lanceolate, cuneately tapering at base, obtuse at apex, incised-crenate-dentate with 4–9 obliquely semi-ovate or oblong, obtuse or rounded teeth on each margin, the uppermost subentire, green or gray-green, copiously and finely appressed-hairy above, densely and thinly appressed-gray-tomentose beneath, with slightly prominent nerves, on petioles to 1 cm long; inflorescences 2.5–6 cm long, ovoid or oblong, rather loose; bracts 7–12 mm long, 1.5–7 mm wide, in fruit only slightly exceeding calyx, herbaceous, ovate-lanceolate, keeled and commonly navicular-plicate and curved, gradually acuminate, sparsely appressed-tomentulose, pale grayish-green, in fruit sometimes slightly suffused with lilac; calyx ca. 2 mm long, with short coarse tomentum interspersed with stipitate glands, ca. 5 mm long in fruit (including scutellum); corolla long, ca. 2.5 cm, yellow, with slender, slightly curved tube and short, greenish-brown lower lip, covered outside with long spreading hairs; nutlets 1.3 mm long, gray with appressed pubescence. May–June, again in August.

Dry stony slopes, limestone, gravelly taluses. — Caucasus: *S. Transc.* **Gen. distr.:** N. Iran. Described from vicinity of Dzhu'fa between Negram and Daroshan railroad stations. Type probably in Baku, topotypes in Leningrad.

- 129 Series 2. *Tauricae* Grossh. in Izv. Azerb. fil. AN SSSR, 3 (1945) 79, ampl. (incl. ser. Boissierianae Grossh. l. c.). — Perennials; stems ascending to procumbent, not or scarcely woody at base; leaves ovate, usually truncate at base; petioles typically rather long (often nearly as long as blade); flowers pale yellow. Crimean-Caucasian forms.

Note. Grossgeim included only the one *S. taurica* Juz. in the series *Tauricae*, but this species is so closely allied to *S. stevenii* Juz., with which it undoubtedly vicariates and from which it differs only in vesture, that there is no reason for placing these two species in different series. Although the name *Boissierianae* Grossh. (proposed by Grossgeim for the series which we have combined with *Tauricae* Grossh. s. str.) has strict priority, we cannot accept it as such since our interpretation of *S. boissieri* Sosn. differs from Grossgeim's (see Note to this species).

38. *S. taurica* Juz. in Bot. zhurn. SSSR, 24, Nos. 5–6 (1939) 434. — *S. orientalis* Schmalh. Fl. II, 326 et auct. fl. taur. p. p. — *S. orientalis* var. *chamaedryfolia* N. Pop. in Mat. fl. Kavk. IV, 3 (1916) 73, p. p. non Rechb. — *S. orientalis* var. *taurica* N. Pop. 81, p. p. — **Ic.:** Grossg. in Izv. Azerb. fil. AN SSSR, 3, 85, Figure 4.

Subshrub 10–25 cm high; caudex woody, strongly branching, creeping; stems numerous, ascending at base, flexuous, branching; stems and petioles densely covered with long

soft crisp spreading hairs; internodes short to medium; leaves on petioles 3–9 mm long, small, 5–14 mm long, 3–10 mm wide, ovate, with truncate or slightly tapering (broadly cuneate) base, with 3–7 long, usually narrow, rather unequal, obtuse, often retrorse teeth on each margin, grayish above, softly white-tomentose-villous on both sides, very densely so beneath, with rather distinct veins; inflorescences ca. 3 cm long in flower, ca. 6 cm in fruit, rather dense at first, becoming loose; lower bracts ca. 1 cm long, 4 mm wide, narrowly ovate to ovate-lanceolate, incurved and conduplicate, gradually tapering to a longish point, densely tomentose, grayish-green; calyx ca. 2 mm long; corolla to 2 cm long, yellow, densely hairy outside. (June) July–September. (Plate VIII, Figure 1.)

Stony slopes and placers, outcrops of limestone, steppes. — European part: Crim. (western part of peninsula; region of Sevastopol' and southern coast to Simeniz). Endemic. Described from Kikeneiz. Type in Leningrad.

130 Notes. 1) *S. orientalis* var. *taurica* N. Pop., a "variety" established by Popov, does not in any way conform to our species; it merely represents specimens of three different species, *S. taurica* Juz., *S. stevenii* Juz. and *S. heterochroa* Juz., mostly encrusted with limestone or chalk.

2) Grossgeim reported *S. taurica* for the Caucasus (Novorossisk area), but the report was based on a misunderstanding. Apparently for this reason he set up this species as a monotypic series (see above).

39. *S. stevenii* Juz. in Bot. zhurn. SSSR, 24, Nos. 5–6 (1939) 435. — *S. orientalis* Schmalh. Fl. II, 326 et auct. fl. taur. p. p. non L. — *S. orientalis* var. *chamaedryfolia* (non Rchb.) et var. *taurica* N. Pop. in Mat. Fl. Kavk. IV, 3 (1916) 73 et 81, p. p.

Perennial; similar to the preceding species, but stems and petioles appressed-tomentulose; leaves 0.6–1.4 cm long, 3–9 mm wide, sparsely grayish-green-tomentose above, densely white-tomentose beneath, with completely concealed veins and usually short straight broad teeth; bracts 5–13 mm long, 2–4 mm wide, densely appressed-tomentose, grayish; calyx tomentose. Otherwise, as in *S. taurica* Juz. July–August.

Dry clayey and stony slopes, limestone outcrops. — European part: Crim. (foothills in vicinity of Simferopol and Bakhchisarai). Endemic. Described from Simferopol. Type in Leningrad.

40. *S. tatianae* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 380. — *S. hypopolia* et *S. stevenii* Grossh. in Izv. Azerb. fil. AN SSSR, 3 (1945) 80, non Juz.

Perennial; allied to *S. stevenii* Juz.; differing in the slightly broader leaves, 0.7–1.7 cm long, 0.5–1.1 cm wide (usually twice as long as wide); bracts also somewhat wider (fully expanded 4–8 mm wide, 8–11 mm long), acute or short-acuminate.

Gravelly mountain slopes. — Caucasus: W. Transc. (Novorossisk). Endemic. Described from Markotkh Range. Type in Leningrad.

41. *S. raddeana* Juz. in Bot. zhurn. SSSR, 24, Nos. 5–6 (1939) 431 (in adnot.). — *S. boissieri* Grossh. in Izv. Azerb. fil. AN SSSR, 3 (1945) 79, non Sosn. in sched. neque Grossh. Fl. Kavk. III (1932) 286; Kharadze in Tr. Tbil. Bot. inst. XII (1948) 11, p. p. — *S. orientalis* var. *chamaedryfolia* N. Pop. in Mat. Fl. Kavk. IV, 3 (1916) 73, p. p. non Rchb. — Ic.: Grossg., op. cit. (1945) 85, Figure 2.

Subshrub 12–22 cm high, with woody creeping caudex; stems numerous, ascending at
131 base, often flexuous; leafy shoots mostly reddening, covered with short crisp appressed
hairs, rather densely above, in lower part frequently subglabrous; internodes generally
elongate; leaves medium or small, 0.7–1.8 cm long, 0.4–1 cm wide, ovate to oblong-ovate,
with truncate or rarely broadly cuneate base, coarsely and rather deeply crenate-dentate
with 4–6 unequal obtuse teeth 1–3 mm long on each margin, green, glabrous above, finely
white-tomentose with indistinct lateral veins beneath; petioles 1–5.7 mm long; inflores-
cences rather dense at first, 2.5–3.5 cm long, later slightly interrupted; bracts loosely
disposed, small, the lower 0.9–1.2 mm long, 4–6 mm wide, ovate, tapering at apex to a
fine sometimes curved point, green, finely puberulent; calyx densely hairy or tomentose;
corolla large, to 3 cm long, yellow, densely hairy outside.

Mountain steppes and subalpine meadows. — Caucasus: Cisc. (center of Main Range).
Endemic. Described from Dzhvari-Vozeli village in Tushetia. Type in Leningrad.

Note. The question of the correct name of this species and the real meaning of the
name *S. boissieri* Sosn. is so complicated that we are devoting a separate article to it.
Here it should only be stressed that Grossgeim, the first to describe this species, combined
under this name two plants that have a certain resemblance in habit, but differ in other
respects. In his “Flora Kavkaza” (Flora of the Caucasus), Grossgeim reported this species
for “Ter.” (where our *S. raddeana* and *S. leptostegia* grow) and “Dag.” (where another
species occurs). In his very brief description he does not mention the bracts. In establish-
ing our *S. raddeana* in 1939, we preserved the name *S. boissieri* for the Dagestan plant
(which we now call *S. granulosa* Juz.) and placed the latter in the series *Platystegiae*. We
were prompted in our decision by Grossgeim’s indication of the height of the stems of *S.*
boissieri as being 30–50 cm (in our material on *S. raddeana* the stems did not exceed
22 cm but in the Dagestan plant very high stems were observed). It should also be men-
tioned that Grossgeim himself (ibid.) placed *S. orientalis* f. *elongata* N. Pop. in the
synonymy of *S. boissieri* Sosn. This form includes as type the Dagestan plant and bears
no relationship to our *S. raddeana* Juz. However, in spite of established usage in botani-
cal nomenclature, Grossgeim did not accept our point of view in his later work and applied
the name *S. boissieri* Sosn. to our *S. raddeana* (including the latter name in the synony-
my of *S. boissieri*) and (incorrectly, in our view) referring *S. boissieri* of our conception
to his *S. daghestanica* (see below). We must categorically oppose Grossgeim’s position
132 which only introduced confusion into the nomenclature of the two species under discussion.

In order to avoid this confusion we refrain from using the name *S. boissieri* Sosn. ex
Grossh.

42. ***S. leptostegia*** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 379. — *S.*
boissieri Sosn. in sched. Herb. Inst. Bot. Tbilis. p. p. vix autem Grossh. Fl. Kavk. III
(1932) 286; Kharadze in Tr. Tbil. Bot. inst. XII (1948) 10 s. str.

Subshrub 12–25 cm high, with short woody caudex and 1–6 ascending stems; shoots
dark violet, subglabrous, lustrous in lower half, with scattered, very short hairs above,
rather densely hairy and whitish at summit; internodes of medium length; leaves on
petioles 3–5 mm long, medium-sized, 6–20 mm long, 3–10 mm wide, ovate or narrowly
ovate, mostly truncate at base, incised-crenate-dentate with 3–5 obtuse teeth to 3 mm long
on each margin, glabrous above, thinly white-tomentose beneath, with indistinct lateral

veins; inflorescence loose, 3–5 cm long at the onset of flowering; bracts loosely disposed, small, the lower 5–7 mm long, 1.5–2.5 mm wide, lanceolate, long-acuminate, green, with very sparse tomentum of short fine appressed hairs; corolla rather small, 2–2.5 cm long, lemon-yellow, with a greenish-brown spot on lower lip, short-hairy and glandular outside. August.

Stony mountain slopes. — Caucasus: Cisc. Endemic. Described from Terek River valley between Chumi and Lars. Type in Leningrad.

Series 3. *Pulchellae* Juz. — Rather low perennials, leaves small, mostly tomentose on both sides, more densely beneath; flowers disproportionately large; corolla anthocyanin-colored or variegated. Siberian and Central Asian species.

43. ***S. grandiflora*** Sims, Curt. Bot. Mag. XVII (1803) tab. 635; Kryl. Fl. Zap. Sib. IX, 2299. — *S. pulchella* Bge. Suppl. alt. (1836) 42; id. in Ind. sem. hort. Dorp. (1840) VIII. — *S. orientalis* γ. *microphylla* Ldb. Fl. Ross. III (1849) 395. — **lc.**: Sims, l. c.

Perennial; root (or caudex) woody, flexuous, more or less branching; stems numerous, 10–20 cm long, flexuous, spreading, branching, short-crisp-hairy, often turning lilac; leaves 5–15 mm long, 3–16 mm wide, ovate or broadly ovate to suborbicular, truncate or slightly cordate at base, obtuse, rather shallowly incised-crenate-dentate at apex with 2–5 orbicular or oblong teeth on each margin, finely appressed-tomentose on both sides, grayish-green above, whitish beneath with short fine crisp hairs, with petioles to 1.2 cm long, approximately as long as or shorter than blade, the veins impressed above, inconspicuous beneath; inflorescences dense, commonly few-flowered, nearly 4-angled, 2.5–4 cm long; bracts 0.5–1 cm long, 1.5–4 mm wide, 3–4 times the length of calyx, ovate-lanceolate or lanceolate, navicular, attenuate toward base, acuminate, slightly keeled, entire or often with few small teeth (mostly one on each margin), with short crisp appressed hairs on both sides, often violet; calyx ca. 2 mm long, densely white-hairy, with subreniform concave scutellum; corolla (1.5) 2–2.5 cm long, sparsely hairy outside, pink-violet or purple, the paler tube curved at base through nearly right angle, the upper lip twice as long as its lateral lobes, barely as long as the lower lip; nutlets ca. 1.5 mm long, trigonous-ovoid, very finely tuberculate, black but appearing grayish because of the dense cover of stellate hairs. June–July. (Plate VIII, Figure 2.)

Stony and gravelly slopes, rocks, pebble-beds. — West Siberia: Alt.; East Siberia: Ang.-Say. (mouth of Kemchik). **Gen. distr.**: Mong. Described from a specimen grown from seed obtained in Siberia. Type possibly in London (or lost?).

44. ***S. tuvensis*** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 389.

Perennial, 10–25 cm high, closely allied to *S. grandiflora* Sims (with which it has so far been confused); root very sturdy, to 1.5 cm in diameter; stems ascending to nearly erect, curved; leaves mostly oblong-ovate, 0.5–2 cm long, 2.5–10 mm wide, usually somewhat attenuate at base, often acute at apex, deeply incised-crenate-dentate with oblong teeth, often slightly recurved, gray-green, prominently veined beneath, flowers in a loose inflorescence; bracts lanceolate, grayish-green (not lilac); corolla blue; nutlets minutely tuberculate, black. Otherwise, similar to *S. grandiflora* Sims. June–August.

Stony river valleys, steppes. — East Siberia: Ang.-Say. (Tuva ASSR). Endemic? Described from Ulu-Khem valley near Kyzyl. Type in Leningrad, isotype in Tomsk.

45. *S. turgaica* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 390.

Perennial; root woody, vertical, branching; stems many, 12–25 cm long, procumbent, strongly and repeatedly branching, crisp-tomentulose, usually turning lilac; leaves small, 134 0.4–1 cm long, 2–8 mm wide, ovate to broadly ovate, truncate or obtusely angled at base, generally acute at apex, incised-crenate-dentate, with 3–5 irregular rounded or oblong, often recurved teeth on each margin, finely gray- or white-tomentose on both sides with short crisp hairs, the veins strongly impressed above, prominent beneath; petioles 1–5 mm long, appressed-tomentulose; inflorescences few-flowered, lax, 2–3 cm long; bracts 8–12 mm long, 2–5 mm wide, ovate, obscurely navicular to nearly flat, keeled, long-acuminate, entire, appressed-tomentulose, with short spreading hairs on the margin, usually violet; calyx ca. 2 mm long, tomentose; corolla 1.5–2 cm long, covered outside with short simple mostly appressed hairs and stipitate glands, the upper lip, its lateral lobes and the back of tube purple, the lower lip and the rest of tube yellow; nutlets ca. 1 mm long, curved-ovoid, grayish, finely foveolate. May–June.

Limestone and clayey-gravelly slopes. — Centr. Asia: Ar.-Casp., Balkh. (western border). Endemic. Described from Espe-Sai ravine in Turgai region. Type in Leningrad.

Note. The shape of the bracts of this species is not characteristic of *Oxystegiae*. It may be a hybrid; the strikingly bicolored flowers would suggest an intermediate position between *S. grandiflora* Sims and *S. sieversii* Bge.

46. *S. karkaralensis* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 391.

Perennial; root woody, angled; stems many, 7–38 cm long, procumbent, branching, slightly geniculate, often flexuous, frequently becoming slightly purple, densely covered with short spreading white hairs; leaves 3–13 mm long, 2–10 mm wide, ovate to triangular-ovate, truncate or slightly tapering at base, obtusely or acutely angular, obtuse, irregularly crenate-dentate, with 2–4 triangular, semi-ovate or oblong, often slightly recurved, obtuse or acute teeth on each margin, grayish-green, finely appressed-tomentose, with deeply impressed veins above, slightly white-tomentose, with prominent veins beneath; petioles villous-tomentose with spreading hairs, half as long as to nearly equaling the blade; inflorescence at first ca. 2–3 cm long, few-flowered, in fruit to 5 cm long, lax; bracts to 9 mm long, 5 mm wide, ovate, subobtusely to short-acuminate, carinate, entire, densely covered 135 with short thin tomentum interspersed with long white spreading hairs, commonly dark lilac, loosely imbricate; flowering calyx ca. 2 mm long, densely covered with spreading white hairs; corolla 1.8–2.7 cm long, bright purple, puberulent and short-glandular outside; tube paler, slender, slightly curved; upper lip longer than the lower; nutlets more than 1 mm long, ovoid, cinereous. May–July.

Slopes of stony coniform hills, mainly on sandy soil. — West Siberia: Irt.; Centr. Asia: Balkh. Endemic. Described from hills near Atasu River and Bektau-Ata Mountain. Type and paratype in Leningrad.

Note. Like the preceding species, *S. karkaralensis* Juz. has bracts of intermediate character; it is thus distinguished from typical *Pulchellae* and from *Platystegiae*. In this feature, and also in shape and dentition of its leaves as well as vesture of its stems and petioles, it

is somewhat reminiscent of *S. sieversii* Bge. We consider it more than probable that both *S. karkaralensis* and *S. turgaica* are the result of hybridization between *S. grandiflora* Sims and *S. sieversii* Bge. (see also Note to *S. sieversii* Bge.).

47. *S. nepetoides* M. Pop. in Bot. mat. gerb. Bot. sada, V (1924) 155 (invalide publ.); Yuz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 395.

Perennial with slender branching rhizome; stems slender, weak, procumbent, distally simple, 5–15 cm long, gray, densely patent-hairy, with remote nodes; leaves small, 5–10 mm long and wide, broadly ovate, subcordate at base, coarsely crenate with 3–5 crenations on each margin, gray-villous on both sides with rather long subappressed hairs, with impressed nerves above; petioles short, white-villous; spikes terminal, at first short, subcapitate, in fruit to 5 cm; bracts shorter than corolla but much longer than calyx, ca. 7 mm long, 3 mm wide, herbaceous, oblong-lanceolate, navicular, acute, slightly tomentose, in young fruit to 1 cm long, later falling away; pedicels erect, as long as the small calyx, both short-hairy; scutellum small, erect, ovate, obtuse; corolla 1.2–1.5 cm long, reddish-yellow, hairy outside, lower lip with a yellow dark-punctate spot; nutlets small, 136 ca. 1 mm long, obovoid, rounded dorsally, with an oblong ventral protuberance, covered with appressed stellate hairs. June–August.

Stony mountain slopes, taluses (in Central Asian juniper zone). — Centr. Asia: Pam.-Al. (northern slope of Alai Range and Sary-Tau Mountain). Endemic. Described from basin of Shakhimardan River, Kichkin River. Type in Tashkent, isotypes in Leningrad.

Note. This and the following three species, while similar in habit to the preceding, differ from them in corolla color and are unlikely to be closely related to them. They should perhaps be segregated as series *Pictae* Juz.

48. *S. picta* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 393.

Perennial, with woody root; stems many, procumbent, branching, 10–20 cm long; shoots (and petioles) densely covered with soft spreading hairs; internodes mostly abbreviated; leaves small, 5–12 mm long, 4–9 mm wide, ovate or broadly ovate, broadly cuneate to subtruncate at base, coarsely crenate with 3–5 obtuse unequal often deeply cut (1–2 mm) crenations on each margin, coarsely gray-tomentose on both sides, often almost villous beneath, the nerves impressed above, prominent and patent-hairy beneath; petioles 1.5–6 mm long; inflorescence 2–3 cm long, at first dense, becoming looser; lower bracts ca. 10 mm long, 3 mm wide, lanceolate or narrowly ovate, tapering at base, acuminate at apex, conduplicate, slightly incurved, tomentulose, long-hairy at margin, grayish-green or dark purple, loosely imbricate; calyx at flowering ca. 2 mm long, very densely white-villous-tomentose; corolla ca. 1.8 cm long, pale yellow, the upper lip vinaceous inside, with a pair of darker longitudinal yellow-rimmed stripes, the lower lip minutely vinaceous-striped and spotted, the tube finely streaked and punctate inside, densely covered with rather long slightly crisp hairs. June–July. (Plate VIII, Figure 3.)

Habitat unknown. — Centr. Asia: Pam.-Al. (Zeravshan). Endemic. Described from Kuli-Kalon Lake. Type in Leningrad.

49. *S. flabellulata* Juz. sp. nov. in Addenda XIX, 344.

Perennial; root vertical, woody; caudex short, nodose; stems many, branching,

137 flexuous, pale, passing above into ascending, lilac-tinged, leafy, annotinous shoots, 4–10 cm long, densely covered with short curved hairs; internodes short; leaves crowded, small, 0.4–1 cm long, 0.3–1 cm wide, broadly ovate to orbicular-rhombic, with broadly cuneate base and obtuse apex, incised-crenate-dentate with 3–6 small crenations on each margin, gray with short coarse tomentum on both sides, the veins very faintly impressed above, prominently flabellate beneath; petioles 1–5 mm long, very densely covered with short spreading hairs; inflorescence 1.5–2 cm long, dense in flower; bracts ovate-lanceolate, obtuse, arched, navicular-conduplicate, lilac-purple, the lower ca. 1 cm long, 4 mm wide, with isolated acute teeth, the upper entire, densely covered with thick short curved hairs, the margin beset with long spreading white cilia; calyx small, villous-hairy, in fruit ca. 4 mm long; corolla 0.7–1.5 cm long, very plain, dull yellowish (cream-colored), densely covered outside with short spreading hairs and stipitate glands, the upper lip violet-purple in upper part, the lower lip with violet-purple spots and lines, the tube finely lined. August.

Mountain slopes, limestone, taluses. — Centr. Asia: T. Sh. (Talass Ala-Tau). Endemic. Described from upper reaches of Ul'kun-Kaindy. Type in Leningrad.

Series 4. *Eu-oxystegiae* Juz. — Genuine subshrubs, the mostly ascending stems strongly lignified in lower part; leaves ovate; flowers mostly pale yellow. Central Asian forms (W. Tien Shan and Pamir-Alai).

50. *S. comosa* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV, (1951) 381.

Subshrub, with woody vertical flexuous root; stems few, 10–32 cm long, arched-ascending to suberect, strongly branching at base, with few usually short branches above, grayish-green with sparse short curved or slightly crisp hairs, sometimes turning lilac (especially in lower part); leaves 0.5–3 cm long, 0.4–2 cm wide, ovate or triangular-ovate, with truncate or sometimes subcordate base, obtuse (the lower) to acute, shallowly crenate-dentate with 3–9 uneven rounded angular mostly obtuse teeth on each margin, 138 green or grayish-green above, covered with very short, fine appressed hairs, evenly densely and finely white- or gray-tomentose beneath, the tomentum completely concealed but the veins usually prominent; petioles 0.2–2 cm long, with short crisp hairs; inflorescence few-flowered, 2–4 cm long at the onset of flowering, with a conelike tuft of nonflowering bracts at summit, finally elongating to 10 cm; bracts 7–12 mm long, 2.5–4.5 mm wide, lanceolate or ovate-lanceolate, navicular, gradually tapering at apex to a long point, gray-green with rather dense fine appressed tomentum, eglandular, often turning lilac; calyx tomentose, in flower 2–2.5 mm long; corolla 1.2–3 cm long, yellow, the lateral lobes of upper lip dark yellow, these and the lower lip finally turning dark brown, the tube slender, curved, densely covered outside with dense tomentum interspersed with few short-stipitate glands; nutlets ca. 1.5 mm long, angled-ovoid, densely white-hairy. April–June. (Plate VIII, Figure 4.)

Stony slopes, rocks, taluses, pebble-beds. — Centr. Asia: T. Sh., Syr. D., Pam.-Al. Endemic. Described from Arslanbob. Type in Leningrad.

51. *S. oxystegia* Juz. in Bot. zhurn. SSSR, 24, Nos. 5–6 (1939) 431. — *S. orientalis* var. *mollis* Briq. in Bot. Tidskr. 28 (1907) 233.

Perennial, very close to *S. comosa* Juz., 10–20 cm high; leaves 0.6–1.5 cm long, 0.5–1.2 cm wide; inflorescence short, 3.5–7 cm long, more compact, without a distinct bracteal tuft at summit; bracts 7–12 mm long, 5–7 (8) mm wide, strongly convex, often obscurely navicular, rather abruptly attenuate from broadly ovate base to a slender point (this shorter than in *S. comosa*), loosely and softly villous-tomentose, the margins beset with rather long, horizontally spreading, almost straight hairs; corolla 2.5–2.7 cm long, essentially pale yellow but upper side of tube more or less suffused with purple. Otherwise, like *S. comosa* Juz. May—beginning of June.

Stony slopes. — Centr. Asia: Pam.-Al. (near Osh). Described from Osh. Type in Leningrad.

Note. As strictly conceived, this species is very stenotopic and is so far known from only two localities: Suleiman-Takhta Mountain (O. and B. Fedchenko, Korzhenevskii, Butryakov and probably O.W. Paulsen) and the highway leading to Naukat, 12 km south of Osh (O. Knorring). Apparently these habitats lie at the periphery of the very extensive distribution area of *S. comosa* Juz. which we did not originally distinguish from the true *S. oxystegia*.

52. *S. microdasys* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 382. — Ic.: Juz., op. cit. 383, Figure 2.

Subshrub, with vertical woody flexuous branching root; stems few, 10–25 cm high, ascending, erect or suberect, usually subvaricately branching from base, woody in lower part, profusely branching above, the branches erect, leafy, often lilac-tinged, sparsely covered with very short curved white hairs; leaves 0.7–2.6 cm long, 0.4–1.8 cm wide, ovate to subrhombic, the lower sometimes faintly cordate or truncate at base or mostly all leaves cuneately tapering to petiole, obtuse or (the upper) acute, very shallowly crenate-dentate with 4–7 short strongly beveled obtuse teeth on each margin, green or grayish-green, sparsely and very finely tomentulose above, covered beneath with very dense fine appressed white or gray tomentum, a lilac tinge sometimes showing in lower part, the prominent veins diverging almost flabellately from base; petioles 1–8 mm long, sparsely appressed-tomentose; inflorescence ca. 3 cm long, in fruit to 7 cm; bracts ovate or narrowly ovate, concave but not navicular, tapering at base, entire, obtuse or slightly acuminate at apex, finely appressed-tomentulose, eglandular; calyx small, accrescent in fruit to 7 mm long (including scutellum), tomentulose, eglandular; corolla ca. 2.5 (to 2.8) cm long, sparsely covered outside with short tomentum interspersed with few indistinct short-stipitate glands, yellow, the lateral lobes of upper lip often reddish, the lower lip with a large reddish-brown spot; nutlets to 1.5 mm long, angled-ovoid, densely white-appressed-pubescent. May.

Low plains and steppe ridges. — Centr. Asia: Syr D. Endemic. Described from near Saryagach station in S. Kazakhstan. Type and paratypes in Leningrad.

Note. The bracts of this and the next species have the characteristic vesture of *Eu-oxystegiae*, but in shape they approach *Mesostegiae* Juz.

53. *S. androssovii* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 397.

140 Perennial, with flexuous, woody root; caudex short, nodose, ascending or procumbent, with woody ramifications; stems numerous (more than 12), herbaceous, procumbent or

ascending, 10–18 cm long, partly sterile, sparsely covered with very short slightly crisp hairs, usually turning lilac; leaves 7–18 mm long, 6–12 mm wide, subrhombic, cuneately tapering at base to short and broad petiole, subacute to mostly obtusish, in upper part with few (2–5 on each margin) large, uneven, rather deeply incised, obtuse teeth, gray-green on both sides, covered with long, slightly crisp hairs (more densely beneath), the veins rather indistinct; inflorescence 2–2.5 cm long, few-flowered; bracts to 11 mm long, 9 mm wide, ovate, distinctly point-tipped, sparsely appressed-tomentulose, eglandular, sporadically lilac, the lower with occasional large teeth; calyx rather densely short-hairy, eglandulose; corolla ca. 2.5 cm long, yellow, covered outside with short hairs and very short-stipitate glands, the upper lip and lateral lobes lilac-tipped, the tube long and curved; nutlets unknown. May–June.

Sandy and gravelly hills, pebble-beds, dry riverbeds. — Centr. Asia: T. Sh. (foothills of Kara-Tau Mountains). Described from Balamurun survey mark near Chiili station. Type in Leningrad.

Note. This species could be included in the next series; it closely approaches *S. kursancvii* Pavl. and *S. titovii* Juz.

Series 5. *Mesostegiae* Juz. — Bracts more or less distinctly keeled, navicular, as in the preceding series (although usually slightly broader), but with vesture consisting of three components: imperfect tomentum of rather coarse crisp hairs; simple, long, soft hairs (these sometimes nearly absent); small stipitate glands (usually very few).

Note. In this series we have provisionally set apart a number of Central Asian species which vicariate geographically with each other and are morphologically intermediate between the series *Eu-oxystegiae* and *Eu-platystegiae*. They may be products of hybridization, of the kind represented in the Caucasus by such forms as *S. granulosa* Juz. and *S. rhomboidalis* Grossh. In Central Asia, however, these hybridization processes were of far greater scope and in places where supposedly hybrid species of the series *Mesostegiae* occur, it is impossible at present to find the typical “parent” forms (with the exception of forms that grow alongside *S. titovii* Juz. in the Chu-Ili Mountains and also border upon *S. transiliensis* Juz.

54. *S. mesostegia* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 385. — *S. subpinnatifida* Iljin in sched. non *S. orientalis* var. *pinnatifida* Ldb.

Perennial; root woody, vertical, flexuous; stems few, 10–25 cm long, ascending, usually slightly flexuous, strongly branching at base, sparingly above, sparsely covered with very short crisp hairs, often turning lilac; leaves 0.7–2.5 cm long, 0.4–1.5 cm wide, ovate or oblong, usually tapering at base, obtuse or acute at apex, deeply (to 1/3 leaf width) incised-dentate with 4–8 long digitate obtuse teeth on each margin, sparsely covered above with short fine flexuous hairs, densely gray-appressed-tomentose beneath, distinctly though not prominently veined; petioles 1–17 mm long; inflorescence at first 3–5 cm long, elongating to 10 cm; bracts to 0.8–2 cm long, 0.4–1 cm wide, narrowly ovate, attenuate at apex to a rather long point, with prominent keel and lateral nerves, usually curved and often navicular, with sparse short tomentum, usually turning lilac (especially in upper part), the margin with long simple hairs interspersed with occasional short stipitate glands; calyx in flower

(143)

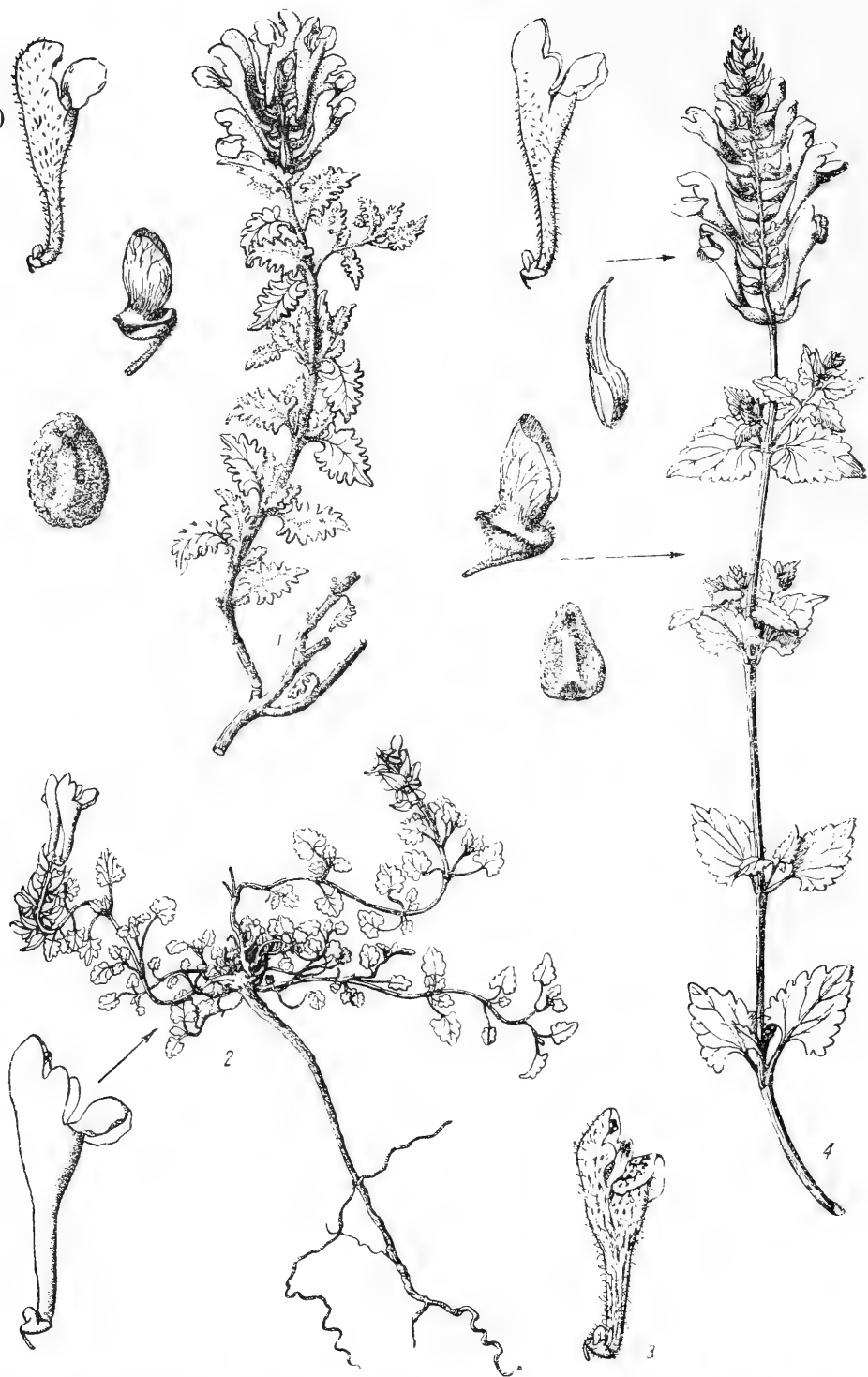


PLATE VIII. 1 – *Scutellaria taurica* Juz., general aspect, flower, fruiting calyx, nutlet; 2 – *S. grandiflora* Sims, general aspect, flower; 3 – *S. picta* Juz., flower; 4 – *S. comosa* Juz., flowering stem, bract, flower, fruiting calyx, nutlet.

to 3 mm long, hairy and abundantly glandular; corolla 2–2.8 cm long, hairy and densely stipitate-glandular outside, yellow, the upper (and lower) lip very often turning purple, the lateral lobes of upper lip brown; nutlets to 2 mm long. May–July.

Stony and gravelly slopes, steppes, pebble-beds. — Centr. Asia: T. Sh. (foothills of Kirgiz and Talass Ala-Tau, Ichkele-Tau Range). Described from northern foothills of Kirgiz Ala-Tau near Tort-Kul Lake and from the vicinity of Dzhambul. Type and paratype in Leningrad.

55. **S. kurssanovii** Pavl. in Byull. Mosk. obshch. isp. prir. XLVII (1938) 82.

142 Perennial, with robust woody root; caudex woody, with short procumbent or ascending ramifications; annotinous shoots (stems) numerous, 20–25, herbaceous, slightly ascending at base or some suberect, 10–20 cm high, densely patent-hairy, the hairs short, crisp; leaves 7–15 mm long, 3–10 mm wide, ovate or triangular-ovate, cuneate or rarely obtuse at base, acute at apex, with 3–6 large obtuse or rounded crenations on each margin, grayish with very profuse crisp hairs, more densely and coarsely tomentose beneath and here sometimes whitish, with slightly protruding midrib and lateral nerves; petioles slender, shorter than blade, patent-hairy; inflorescence 2–3 cm long, 6–10-flowered, dense or finally rather loose; bracts ovate or oblong, short-acuminate or acute, entire, often colored in upper half, with long spreading crisp hairs and few short stipitate glands, nearly flat; calyx small, subsessile, with short glandular and long hairs; scutellum large, rounded, glabrous; corolla large, 25–30 mm long, tube long, slender, curved, yellow, on the outside intensely dark purple (like the appendages), puberulent; upper lip covered outside with long hairs; lower lip yellow, with a dark brown spot at base or plain dark brown; anthers exserted, hairy; nutlets ca. 1 mm long, whitish-puberulent. May.

Stony steppes. — Centr. Asia: T. Sh. (Kara-Tau Mountains). Endemic. Described from Kainar terrace (from Arkhireev collections). Type (Pavlov, Number 3031) in Moscow.

56. **S. titovii** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 388.

145 Perennial; root woody, flexuous; caudex strongly branching; stems 15–25 cm long, numerous, ascending, imperfectly tomentose with rather profuse long spreading hairs, green or faintly anthocyanin-colored; leaves 0.6–2.3 cm long, 0.4–1.2 cm wide, ovate, with obtusely angled or nearly cuneate base, tapering to long slender hairy petiole to 2 cm long, deeply incised-dentate with 2–6 (commonly 4) oblong obtuse and often recurved teeth on each margin, with short scattered very fine slightly crisp hairs above, imperfectly tomentose beneath with sparse fine appressed hairs, green at both sides or young leaves on lateral branches usually whitish; inflorescence at first 3 cm long, in fruit to 6 cm, loose; bracts small or medium, after flowering to 1.5 cm long, 7 mm wide, slightly scarious, covered with spreading incomplete tomentum and numerous spreading simple hairs of moderate length, more profusely along margins, with few intermixed short-stipitate glands, pale green or sometimes faintly lilac; calyx at first small, rather densely and short-hairy, glandular, in fruit approximately as long as bracts; corolla to 2.5 mm long, covered outside with fine short hairs and stipitate glands, yellow, the lateral lobes and the tip of upper lip dark purple, the tube slender, slightly curved; nutlets to 2 mm long, grayish-white. June–July.

Gravelly and stony places. — Centr. Asia: T. Sh. (western part), Balkh. (Chu-Ilii Mountains). Endemic. Described from gorge of Aktasty Mountain and natural boundary Ak-Dzhar. Type and paratype in Leningrad.

57. *S. catharinae* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 386.

Perennial, with almost simple vertical woody flexuous root; caudex very short, branching; stems numerous, 12–25 cm long, ascending or nearly procumbent, branching all the way up, with scattered minute crisp hairs, dark lilac; leaves small, 6–15 mm long, 2.5–12 mm wide, ovate or narrowly ovate, generally short-cuneate, tapering at base to slender petiole 1–7 mm long, the uppermost subsessile, subobtuse or subacute, incised-crenate-dentate with oblong or subtriangular obtuse or subacute teeth, yellow-grayish-green above, very finely and sparsely pubescent, glaucescent-gray-green beneath, rather densely tomentose with very short fine completely appressed hairs, prominently veined; inflorescence short, at the onset of flowering ca. 2 cm long, in fruit to 5 cm long, loose; bracts small, to 7 mm long, 6 mm wide, subherbaceous, ovate to broadly ovate, convex, distinctly keeled, short-acuminate, with sparse and fine tomentum of very short appressed crisp hairs, some longish hairs especially along margins, and isolated glands, dark lilac; calyx small in flower, densely short-hairy, slightly glandular, in fruit equaling or slightly exceeding bracts; corolla 1.5–2.5 cm long, abundantly covered outside with short-stipitate glands and hairs, yellow, the lower lip and the lateral lobes of upper lip intensely colored, the tube slender, curved; nutlets ca. 1.5 mm long, grayish-white. June.

146 Sandy steppes, stony and gravelly slopes, pebble-beds. — Centr. Asia: Balkh. (southeastern part). Endemic. Described from Taldy-Kurgan. Type in Leningrad.

Group 2. *Platystegiae* Juz. in Bot. zhurn. SSSR, 24, Nos. 5–6 (1939) 433 (pro serie). — Bracts usually rather broad, ovate or broadly ovate, slightly concave or nearly flat, not navicular (only rarely keeled), at apex angled or shortly and usually abruptly acuminate, hairy and stipitate-glandular.

Note. As mentioned before, we originally gave this group the rank of series. Grossgeim in "Izvestiya" Azerb. fil. AN SSSR (3, 1945, 80) made an attempt to classify it as a subsection composed of a number of series; these, however, lack in clear characteristics and are completely arbitrary in content. In the present volume we have subdivided the group *Platystegiae* into two series and we have completely rejected the classification proposed by Grossgeim.

Series 1. *Eu-platystegiae* Juz. — Series Orientales, Oreophilae, Karjaginae, *Platystegiae*, *Artvinenses*, *Darrienses* Grossh. in Izv. Azerb. fil. AN SSSR, 3 (1945) 80–83. — Perennials; stems not woody or slightly woody at base; bracts covered mainly with simple hairs and with short-stipitate glands visible only under magnification.

Note. Besides the regular species of this extensive series, we have tentatively incorporated two forms that are apparently hybrids (these were referred to in the Note to the series *Mesostegiae* of the group *Oxystegiae*).

58. **S. transiliensis** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 397.

Perennial with vertical woody root; caudex branching, procumbent; stems numerous, 12–40 cm long, ascending or suberect, curved or slightly flexuous, with short spreading crisp hairs, usually not colored or faintly lilac only at base; leaves 0.7–3 cm long, 0.3–2 cm wide, triangular-ovate or sometimes oblong, mostly with truncate or broadly cuneate base, acute, deeply (to 1/4–1/3 leaf width) incised-dentate with 4–8 irregular oblong rounded or often acute teeth on each margin, green, sparsely short-hairy above, gray beneath with very fine appressed tomentum, the midrib and lateral veins prominent; petioles slender, 0.2–1.8 cm long, pubescent; inflorescence initially dense, capitate, 3.5–5 cm long, 147 elongating to 12 cm; bracts almost scarious, to 1–1.8 cm long, 0.6–1 cm wide, ovate to broadly ovate, long-acuminate, covered all over with long hairs interspersed with few short stipitate glands, usually pale green (uncolored); flowering calyx 3–4 mm long, hairy and glandular; corolla large, 2.5–3.7 cm long, hairy and stipitate-glandular outside, yellow, the tip of upper lip and lateral lobes often suffused with purple; nutlets ca. 1.5 mm long, angled-ovoid, bluish-white with dense pubescence. May–July. (Plate X, Figure 1.)

Mountain slopes, taluses. — Centr. Asia: T. Sh. (mainly Zailiiskii Ala-Tau). Endemic. Described from vicinity of Alma-Ata. Type in Leningrad.

59. **S. alberti** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 399.

Perennial, with woody flexuous root; stems several to many, 9–32 cm long, mostly ascending, straight or curved, sometimes flexuous, branching at base, sparsely tomentulose, often turning lilac; leaves 0.6–2.2 cm long, 0.5–1.5 cm wide, rather broadly ovate or elliptic, truncate or obtusely angled at base, at apex mostly obtuse, rather deeply incised-dentate (to about 1/4 leaf width), with 4–6 large oblong round-tipped teeth on each margin, green or usually grayish-green above, with fine scattered tomentum, densely white- or grayish-tomentose beneath, the veins not or slightly prominent; calyx 0.2–1.3 cm long, sparsely tomentulose; inflorescence 2.5–5 cm long in flower, later reaching 12 cm, loose; bracts almost scarious, to 1.5 cm long, 1 cm wide, ovate to broadly ovate, attenuate at both ends, acute at apex, with somewhat prominent nerves, covered with long hairs interspersed with few minutely stipitate glands, usually not colored; calyx densely hairy and glandular; corolla rather large, 2.2–3 cm long, hairy and short-stipitate-glandular outside, plain yellow or sometimes the upper lip with purple lateral lobes and lower lip darker (sometimes brown); nutlets ca. 1.5–2 mm long. May–July.

Dry pebbly riverbeds, sandy and stony river shoals, stony and gravelly slopes. — Centr. Asia: Dzhuz.-Tarb. (southern part of Dzhungaria Ala-Tau). — **Gen. distr.:** Dzhuz.-Kash. Described from the vicinity of Dzharkent. Type in Leningrad.

148 60. **S. przewalskii** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 400. — *S. orientalis* var. *pinnatifida* auct. nonnull. non Rechb. — **Ic.:** Yuz., op. cit. 401, Figure 3.

Perennial; root woody, oblique or vertical, flexuous; stems few, 6–20 cm long, ascending or nearly procumbent, curved or flexuous, mostly strongly branching at base, otherwise simple, rarely branching above, sparsely tomentulose, often suffused with lilac; leaves 0.6–2.2 cm long, 0.4–2 cm wide, ovate or elliptic, truncate or rarely obtuse-angled at base, obtuse at apex, very deeply pinnatisect-dentate (width of the middle part of leaf often

scarcely exceeding the teeth), with 4-7 long digitate teeth 2-8 mm long on each margin, the lower leaves usually horizontally directed or reclinate, the upper obliquely ascending, dull green or cinereous-green above with sparse fine tomentum and with impressed veins, white- or gray-tomentose beneath with fine appressed hairs, the veins not or slightly prominent; petioles 1.5-14 mm long, pubescent; inflorescence 2.5-4 cm long, elongating in fruit to 7 cm; bracts to 8-15 mm long, 6-10 mm wide, broadly ovate, acute or acuminate, long-villous, or without isolated short-stipitate glands, usually turning lilac (especially in upper half), with prominent midrib and rather faint lateral nerves; calyx in flower to 4 mm long, villous-hairy or glandular; corolla 2-4 cm long, hairy and short-stipitate-glandular outside, plain yellow or the upper lip and its lateral lobes turning purple; nutlets ca. 1.75 mm long, angled-ovoid, densely white-hairy. June-October.

Steppes, dry sandy and clayey-stony exposed slopes, riparian and lacustrine terraces, banks and dry riverbeds. — Centr. Asia: T. Sh. (central part). Endemic. Described from Lake Issyk-kul' near mouth of Karakolki River. Type in Leningrad.

61. **S. soongorica** Juz. sp. nov. in Addenda, XIX, 345. — ? *S. orientalis* Sievers in Pall. Neueste nord. Beitr. III (1796) 262, non L. — *S. orientalis* β . *pinnatifida* Ldb. Fl. Ross. III, 1 (1847-1849) 395, p. p. (non Rchb.) et *e. erecta* Ldb. l. c.

Perennial; root woody, flexuous; caudex short, strongly branching; stems numerous, 15-30 cm high, ascending or suberect, flexuous, with sparse short crisp hairs, green or lilac; leaves small, 0.5-1.5 cm long, 0.2-0.8 cm wide, narrowly triangular-ovate or oblong, with 149 truncate or mostly cuneate base, acute at apex, deeply incised-dentate (to about the middle of half-blade width) with 4-7 subequal oblong obliquely antrorse apically rounded slightly recurved teeth on each margin, grayish-green, diffusely tomentulose above, whitish beneath with very fine appressed tomentum, prominently veined; petioles slender, to 1 cm long, tomentose; inflorescence at first short, becoming strongly elongated, loose; bracts almost scarious, 0.6-1 cm long, 0.4-0.8 cm wide, ovate to narrowly ovate, acuminate, strongly convex, rather densely covered (especially along margins) with long spreading hairs interspersed with short-stipitate glands, pale green, often suffused with lilac; calyx in flower 2-3 mm long, hairy and glandular, in fruit with scutellum ca. 3-4 mm long; corolla rather small, 1.4-1.7 cm long, pubescent and glandular outside, yellow, usually with a violet spot on lower lip; nutlets ca. 1 mm long, ovoid, whitish, with dense soft pubescence. June-July.

Pebble-beds and sands along banks of streams, rarely on loess. — Centr. Asia: Dzu.-Tarb. Endemic? Described from Lepsa River. Type in Leningrad.

Note. For Sievers' plant from Dzharguban (near sources of Irtysh), provisionally placed here in the synonymy, see Note to *S. sieversii* Bge.

62. **S. krylovii** Juz. in Sist. zametk. mat. gerb. Kryl. Tomsk. Gos. univ. 10, No. 8 (1936) 4; Kryl. Fl. Zap. Sib. IX, 2301.

Perennial, ca. 25 cm high; stems woody in lower part, procumbent or ascending, branching near base, the branches strongly elongated; stems and branches flexuous, sparsely and very finely crisp-puberulent and glandular, dark purple to almost blackish-purple; leaves 1-2 cm long, 0.8-1.6 cm wide, rather hard, ovate to mostly broadly ovate, slightly tapering at base, obtusely angled, at apex acute, coarsely and unevenly

incised-dentate or crenate with 4–6 obliquely antrorse oblong straight acute or mostly obtuse teeth 1.5–3.5 mm long on each margin, light green, sparsely and very finely hairy above, grayish with very fine appressed tomentum beneath, the midrib prominent, petioles 3–12 mm long, half as long to nearly as long as blade; inflorescence 3–3.5 cm long in flower; bracts broadly ovate, acuminate, with slightly protruding longitudinal nerves, pale
150 green, with very short hairs along margins and nerves; lower bracts 1.5 cm long and 0.9 cm wide; calyx ca. 3 mm long in flower, very finely pubescent and glandular; corolla to 2.5 cm long; yellow, hairy outside, with short glandular tube. July–August.

Sands. — West Siberia: Alt. (southern part); Centr. Asia: Balkh. (eastern part), Dzu.-Tarb. (Tarbagatai, northwestern slope of Dzhungaria Ala-Tau). **Gen. distr.:** Dzhuz.-Kash. Described from Blandy-Kum sands between Nikolaevka and Aleksandrovka (Zaisansk area). Type in Leningrad, isotype in Tomsk.

63. **S. sieversii** Bge. in Ldb. Fl. Alt. II (1830) 394, sensu stricto; Kryl. Fl. Zap. Sib. IX, 2300. — **S. orientalis** δ . adscendens Ldb. Fl. Ross. III, 395. — **lc.:** Ldb. Ic. pl. Fl. Ross. II, tab. 123.

Perennial; rhizome branching, woody; stems numerous, 7–15 (20) cm high, forming loose tufts, ascending or suberect, mostly strongly branching at base, simple or weakly branching above, covered with soft somewhat crisp spreading hairs, usually greenish or lilac in lower part; internodes usually few, rather short; leaves 0.5–2.5 cm long, 0.2–1.5 cm wide, ovate to rhombic, obtuse or cuneate at base, mostly subacute, coarsely dentate with 3–7 long subdigitate acute often recurved teeth 1–5 mm long on each margin, short-tomentose on both sides, more copiously beneath, grayish-green or the underside often canescent, with somewhat prominent veins; petioles as long as or slightly shorter than blade, covered with long spreading hairs; flowers short-pedicelled; inflorescences capitate, loose, 2–6 cm long, slightly elongating after flowering; bracts broadly ovate or ovate, tapering at base, densely covered outside with long spreading hairs, finely glandular, grayish-green or sometimes slightly purple, with slightly protruding midrib and a few lateral nerves, the lower ca. 1.5 cm long, ca. 0.6 cm wide; calyx ca. 2 mm long, densely hairy and glandular; corolla 1.8–2 cm long, glandular-hairy outside, pale yellow, sometimes the lateral lobes of upper lip or the whole upper lip violet and the lower lip with a greenish-brown spot; middle lobe of upper lip twice as long and wide as the lateral lobes; lower lip orbicular, slightly cleft; corolla-tube strongly elongated, very slightly curved; nutlets ca. 2 mm long, trigonous-ovoid, densely covered with short grayish hairs. June–July. (Plate X, Figure 2.)

151 Dry stony or gravelly slopes, clayey steppes and semideserts. — West Siberia: Irt.; East Siberia: Ang.-Say. (Minusinsk); Centr. Asia: Balkh. **Gen. distr.:** Mong. (northwestern part). Described from rocky places on Arkaul Mountains “Dolenkaraut Tschingistau.” Type in Leningrad.

Notes. 1) The original plant of Sievers, to whom the species is dedicated, was included here by Bunge, but it differs from Meier’s plant which was actually described by Bunge and, in our opinion, does not belong to *S. sieversii* Bge. s. str. At least the Sievers specimen preserved in the herbarium of the Botanical Institute of the Academy of Sciences of the USSR would be more appropriately referred to *S. soongorica* Juz.

2) It is of considerable interest that forms occur in nature which are very similar to

S. sieversii Bge., but have a purple corolla. We were not inclined to refer such forms to *S. sieversii* and we have therefore omitted any reference to such coloring in describing the flowers of this species. In the herbarium, we have named one of these forms *S. ulutavica* Juz. (from its habitat in the Ulu-Tau Mountains), but the few specimens are old and in a poor state of preservation and we have therefore refrained for the time being from offering a description. We assume that the existence of such forms is evidence of hybridization between species of the series *Pulchellae* and *Platystegiae* that has given rise to such species as the above-described *S. turgaica* and *S. karkaralensis*, or *S. ulutavica*.

64. ***S. hypopolia*** Juz. in Bot. zhurn. SSSR, 24, Nos. 5-6 (1939) 433. — *S. orientalis* α. *chamaedryfolia* Ldb. Fl. Ross. III, 395, p. p.; N. Pop. in Mat. fl. Kavk. IV, 3, 73, p. p. non Rchb.

Perennial, plant 6-25 cm high; stems numerous, ascending at base or nearly procumbent, curved or flexuous, tomentulose in lower part, densely covered above, especially in inflorescence, with short spreading hairs; leaves 5-17 mm long, 3.5-12 mm wide, ovate, usually obtusely angled or sometimes cuneate at base, much more rarely truncate, irregularly and deeply incised-crenate-dentate with 5-7 obtuse to subacute often revolute medium-sized teeth (1-2.5 mm long) on each margin, green and finely puberulent above, very densely white-tomentose beneath, the often prominent veins completely hidden by tomentum; petioles 1.5-10 mm long; inflorescences 2.5-4 cm long, dense, in fruit up to 10 (?) cm long, rather lax; bracts broadly ovate, concave, subacuminate to acuminate, the lowermost ca. 10 mm long, 7-9 mm wide, covered with dense or very dense rather long and soft hairs interspersed with numerous stipitate glands, greenish or later slightly reddening, with prominent nerves; calyx hairy and glandular; corolla 1.5-2.5 cm long, yellow, hairy and glandular outside. April-June.

Stony slopes, limestone and chalk outcrops, steppes. — European part: Crim. (foothills). Endemic. Described from Karasubazar, Kara-Kush. Type in Leningrad.

65. ***S. heterochroa*** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 402. — *S. orientalis* Schmalh. Fl. sr. i yuzhn. Ross. II, 326 et auct. fl. taur. p. p. non L. — *S. orientalis* var. *chamaedryfolia* N. Pop. in Mat. fl. Kavk. IV, 3 (1916) 73, p. p. non Rchb. — *S. orientalis* var. *taurica* id. ibid. (1916) 81, p. p.

Perennial, 16-26 cm high, very similar to *S. hypopolia* Juz.; distinguished primarily by the shorter, often suborbicular leaves, these usually not more than 1.5 cm (rarely to 2 cm) long, to 1.5 cm wide, usually truncate at base, the teeth more obtuse and slightly divaricate, inflorescences more floriferous, finally much elongated, reaching 15 cm in fruit; bracts somewhat smaller (the lowermost approximately to 6-8 mm long and to 8-9 mm wide), obtuse to short-acuminate, usually turning lilac, flowers pure yellow, purple or purple-yellow (with purple lips and upper part of flower and yellow tube). June-July.

Stony places. — European part: Crim. (mainly eastern part). Endemic. Described from vicinity of Karadag biological station. Type in Leningrad.

66. ***S. hirtella*** Juz. in Bot. zhurn. SSSR, 24, Nos. 5-6 (1939) 434. — *S. orientalis* var. *chamaedryfolia* N. Pop. in Mat. fl. Kavk. IV, 3 (1916) 73, p. p. non Rchb.

Perennial, 5-20 cm high; leafy stems numerous, ascending at base, curved, very densely

covered, like petioles, with spreading or reclinate soft crisp hairs; internodes of medium length or short; leaves 0.5–2 cm long, 0.45–1.9 cm wide, broadly ovate to suborbicular, usually truncate at base, coarsely and deeply (to 1–4 mm) incised-crenate with 3–6 equal, obtuse teeth on each margin, grayish, densely hairy, rugose, with impressed veins above, very densely white- or usually gray-tomentose to almost villous, with very distinct veins beneath; petioles 0.5–1.5 cm long; inflorescences 2.5–4 cm long, in fruit to 6 cm, dense
153 or very dense; bracts closely imbricated, broadly ovate, convex or nearly flat, acuminate greenish, covered with simple long hairs and copious stipitate glands, prominently nerved, the lower ca. 1 cm long, 0.8 cm wide; flowering calyx ca. 2.5 mm long; corolla medium to fairly large, 2–3 cm long, yellow, densely covered outside with glandular and simple hairs. May–June.

Stony mountain slopes, rocks. — European part: Crim. (Crimean State Reserve). Endemic. Described from rocks near the sources of Sary Su River. Type in Leningrad.

67. **S. novorossica** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 403. — *S. hirtella* Grossh. in Izv. Azerb. fil. AN SSSR, 3 (1945) 80, non Juz.

Subshrubs, resembling *S. hirtella* Juz. in habit and in vesture of stems and leaves, but leaves (especially the upper) narrower, often ovate, obtuse-angled at base, deeply incised-dentate with mostly acutish teeth; bracts narrower, frequently ovate, more distinctly acuminate, densely covered with moderately long spreading simple hairs interspersed with rather few substipitate glands. May–June.

Mountain slopes. — Caucasus: W. Transc. (Novorossiisk district). Described from the vicinity of Novorossiisk. Type in Leningrad.

Note. The species is known only from very scanty material and needs further study.

68. **S. polyodon** Juz. in Bot. zhurn. SSSR, 21, Nos. 5–6 (1939) 433, in adnot. — *S. orientalis* Schmalh. Fl. II (1897) 326 et auct. fl. Cauc. p. p. non L. — *S. orientalis* α . chamaedryfolia Ldb. Fl. Ross. III (1847–1849) 395, p. p.; N. Pop. in Mat. fl. Kavk. IV, 3, 73, p. p. non Rechb. — ? *S. caucasica* A. Hamilt. Monogr. (1832) 282 (nomen prius!). — Ic.: Grossg. in Izv. Azerb. fil. AN SSSR, 3 (1945) 85, Figure 6 — Exs: GRF, Number 524.

Subshrub; caudex very short, sturdy, usually horizontal, rarely erect, nodose; stems mostly numerous, ascending or often erect, robust, slightly curved, 10–32 cm long, sparsely covered with short divergent or divaricate curved hairs; internodes as long as or shorter than leaves; leaves medium to fairly large, 0.8–3 cm long, 0.3–1.5 cm wide, oblong-ovate or narrowly triangular, with subcordate, truncate or (the upper) obtuse-angled base, obtuse or (especially the upper) acute at apex, rather deeply incised-crenate-dentate or the
154 upper usually acutely incised-dentate, with 5–13 obliquely antrorse teeth to 4 mm long on each margin, green, sparsely covered with short fine appressed hairs above, densely white-tomentose with fine appressed hairs beneath, the lateral veins not or slightly protruding, often hidden by tomentum; petioles sturdy, suberect, short-tomentose, 0.2–2 cm long, distinct even in upper leaves, these tightly enveloping the lower part of inflorescence; inflorescence 3.5–6 cm long, in fruit to 8 cm, elongate-ovoid or conical, dense; bracts large, to 2 cm long, 1.5 cm wide, of rather firm consistency, ovate, rarely broad-ovate, long-acuminate, entire, pale green or sometimes bright lilac, diffusely covered with short appressed hairs and with scattered punctate or short-stipitate glands, the margins

with spreading short hairs, the interspaces between the prominent longitudinal nerves indistinctly reticulate; flowering calyx ca. 3 mm long, patent-hairy and densely stipitate-glandular; corolla large, to 3–3.5 cm long, to 8 mm wide at throat, yellow, covered outside with short spreading hairs and stipitate glands, the lips approximately equal in length. May–August. (Plate IX, Figure 1.)

Steppe slopes, limestone, limestone and rocky slopes, rocks, gravels, taluses. — Caucasus: Cisc. (foothills of Main Range). Endemic. Described from the vicinity of Kislovodsk. Type in Leningrad.

69. *S. oreophila* Grossh. in Izv. Azerb. fil. AN SSSR, 3 (1945) 80. — *S. orientalis* var. *chamaedryfolia* N. Pop. in Mat. fl. Kavk. IV, 3 (1916) 73, p. p. non Rechb. — Ic.: Grossg., op. cit. 85, Figure 8, 26, b.

Perennial; caudex procumbent, flexuous, rooting at nodes; stems few, 10–30 cm long, usually ascending, rather robust, curved or slightly flexuous, simple or (mostly slightly) branching, sparsely covered with short fine crisp hairs or subglabrous; leaves medium to large, 1–4 cm long, 0.7–2.3 cm wide, half as long (often the middle and upper) to about as long as internodes, broad-ovate, ovate or oblong-ovate, with subcordate or truncate or the upper sometimes with obtusely angled base, mostly obtuse at apex, shallowly incised-crenate with 3–8 mostly oblique semielliptically rounded crenations on each margin, green with scattered fine short hairs, densely covered beneath with fine white or grayish tomentum, the veins not prominent; petioles to 2 cm long, densely tomentulose; inflorescence 3–6.5 cm long, dense, in fruit often loose, 9 cm long; bracts usually large, (1) 1.5–2 cm long, 9–12 mm wide, scarious, ovate or broad-ovate, convex or almost flat, acute or long-acuminate, entire, densely covered on the back with long spreading soft hairs copiously interspersed with short stipitate glands, often suffused with lilac; corolla very large, 3–4 cm long, 6–9 mm wide at throat, yellow, rather sparsely covered outside with fine hairs and glands. June–September.

Alpine pastureland, meadows, mountain-steppe slopes, rocks and taluses in alpine and subalpine mountain belts. — Caucasus: Cisc., Dag., E. Transc. (Greater Caucasus). Endemic. Described from Kryz in Kuba district. Type in Baku.

Note. Since the distribution areas of *S. oreophila* Grossh. and *S. polyodon* Juz. are contiguous, one might expect that intermediate forms between these species would be found in nature. But so far we have not found in the herbarium any obvious transitional forms between these species, except for a single specimen from Mount Oshten. Considering the isolated nature of the location, we can assume that this is a special race, a brief description of which we tentatively present below.

70. *S. oshtenica* Juz. sp. nov. in Addenda XIX, 346.

A perennial plant of an apparently intermediate character, with the overall habit of *S. oreophila* Grossh., but with almost completely glabrous bracts which, in shape, are more like those of *S. polyodon* Juz.; inflorescence very short, few-flowered, nearly globular, not changing in fruit. July.

Grassy slopes, taluses. — Caucasus: Cisc. (Oshten Mountain). Endemic. Described from slopes of Mount Oshten. Type in Leningrad.

71. **S. daghestanica** Grossh. in Izv. Azerb. fil. AN SSSR, 3 (1945) 80, sensu stricto. — *S. orientalis* var. *chamaedryfolia* (non Rechb.) cum f. *elongata* N. Pop. in Mat. fl. Kavk. IV, 3 (1916) 73 et 79, p. p. — Ic.: ? Grossg., op. cit. 85, Figures 9, 26, a.

Subshrub 15–40 cm high; caudex short, branching; stems few, ascending or suberect, elongate, more or less virgate, simple or slightly branching, stout, flexuous, diffusely white-tomentulose with fine-short-white-spreading hairs, usually reddening in lower part, remotely leafy; leaves usually 1/4 the length of internodes, 0.8–2 cm long, 0.4–1.2 cm wide, ovate or oblong, obtuse, deeply incised-crenate with 5–7 semielliptic or oblong obtuse crenations on each margin, grayish-green, sparsely covered with fine spreading hairs above, densely white-tomentulose beneath, the midrib and lateral veins usually very prominent; petioles 1.2 cm long; inflorescence dense, 2.5–5 cm long, becoming loose in fruit, to 7 cm long; bracts scarious but thickish, 7–12 mm long, 6–9 mm wide, broadly ovate to suborbicular, obtuse to short-acuminate, entire, convex, with prominent longitudinal nerves, densely covered on the back, especially on the margins and nerves, with long spreading hairs and short-stipitate glands, pale green, often dull purple in upper half; corolla rather small, ca. 1.5–2.2 cm long, ca. 4 mm wide at throat, yellow, densely hairy and glandular outside. July.

Central mountain belt, rocks. — Caucasus: Dag. Endemic. Described from Ikhrek (Radde collections). Type in Leningrad.

Note. We are interpreting this species in the narrow sense, and we base our approach on an investigation of the “type” selected by Grossgeim himself. However, Grossgeim confused it with some other plants, in particular with *S. granulosa* Juz. and low-growing, high-mountain Dagestan forms of *S. oreophila* Grossh. In other words, he referred all “*S. orientalis*” of Dagestan derivation to *S. daghestanica* Grossh., and this, in our opinion, is quite incorrect.

72. **S. granulosa** Juz. nom. nov. — *S. orientalis* var. *chamaedryfolia* f. *elongata* N. Pop. in Mat. Fl. Kavk. IV, 3 (1916) 79, sensu stricto. — *S. boissieri* Sosn. in schreb. Herb. Inst. Bot. Ac. Sc. URSS (1929) nec alibi; Grossg. Fl. Kavk. III (1932) 286, p. p. nec alibi; emend. Juz. in Bot. zhurn. SSSR, 24, Nos. 5–6 (1939) 431 (nomen ambiguum!). — *S. daghestanica* Grossh. in Izv. Azerb. fil. AN SSSR, 3 (1945) 80, p. p.

Subshrub, 20–45 cm high; caudex ascending or erect, slender, woody, branching; an-
notinous stems elongate, slender, more or less virgate, straight or curved, simple or branch-
ing, with fine curved hairs, usually lilac, remotely leafy; leaves generally small, 1/2 to 1/3
the length of internodes, (0.7) 1.2–2 cm long, (2) 5–10 mm wide, the lowermost broad-
ovate to ovate, others oblong-ovate, acute, shallowly incised-crenate with (3) 5–9 obtuse
or rounded smallish crenations on each margin, diffusely short-hairy above, finely white-
tomentulose beneath, the veins not prominent; petioles to 1 cm long, tomentulose; inflo-
rescence short or oblong, 2.5–6 cm long, dense, becoming loose in fruit; bracts scarious,
157 8–10 mm long, ca. 7 mm wide, convex, broadly ovate-rhombic, acuminate, entire, the
lower with short appressed hairs, others with predominantly long spreading hairs inter-
persed with sessile and short-stipitate glands, with prominent longitudinal nerves and
often distinctly carinate; corolla rather small, ca. 2 cm long, 4 mm wide at throat, yellow,
covered outside with spreading hairs and short-stipitate glands. June–July.

Central mountain belt, gravelly places. — Caucasus: Dag. Endemic. Described from Gimri and Gunib. Type and paratype in Leningrad.

Note. A distinctive and characteristic species known only from certain parts of Dagestan (Gunib district: between Gunib and Chokh, between Gunib and Khunzakh; Avarskii Dagestan, south of Gimri along Koi-Su). Although we have included *S. granulosa* in the *Platystegiae*, this species clearly gravitates toward *Oxystegiae* in some characters (bracts with two types of vestiture and a strongly developed keel). It may possibly be a hybrid which, on the strength of its derivation, constitutes a link between *Platystegiae*, to which we have referred it, and *Oxystegiae*. Grossgeim, in arbitrarily attempting to apply the name *S. boissieri* to our *S. raddeana* (see note to *S. raddeana*), clearly confounded the genuine plant with other forms, notably with his *S. daghestanica* s. str.

73. *S. orientalis* L. Sp. pl. (1753) 598; Ldb. Fl. Ross. III, 395. — *S. orientalis* β . *chamaedryfolia* Rchb. Ic. bot. pl. crit. I (1823) 10; Ldb. Fl. Ross. III, 395, p. p.; N. Pop., in Mat. fl. Kavk. IV, 3, 73, p. p. — *S. orientalis* var. *genuina* Boiss. Fl. or. IV (1879) 682, p. p. — *S. orientalis* var. *pinnatifida* auct. p. p.; N. Pop., op. cit. 79, p. p. non Rchb. — *S. orientalis* var. *chamaedryfolia* f. *elongata* N. Pop. op. cit. 79, pro min. p. — ? *S. bractealis* Stev. ined. (ex sched. Herb. Gay). — ? *S. caucasica* A. Hamilt. Monogr. (1832) 282. — Ic.: Tournef. Voy. II, tab. ad pag. 306; Rchb. l. c., tab. VIII, fig. 17. — Exs.: Fl. Cauc. exs. No. 216.

Subshrub; caudex mostly short, procumbent to ascending, woody, usually flexuous and strongly branching, leafy stems fairly numerous, ascending at base, curved or flexuous, rarely suberect, 7–25 cm long, densely covered with short spreading slightly crisp hairs; internodes mostly short, not exceeding leaves; leaves 0.4–2 cm long, 0.4–1.5 cm wide, rounded-triangular, broad-ovate to ovate, truncate, subcordate or obtusely angled at base, usually obtuse or rounded at apex, deeply (sometimes more than half the half-blade width) incised-crenate or dentate with 3–7 semielliptic or usually oblong to sublinear teeth 1.5–3 mm long on each margin, dark green or gray-green, covered above with short fine appressed hairs, white-tomentose with fine appressed hairs beneath, the veins not prominent or sometimes prominent, mostly concealed by tomentum, without distinct network of veinlets; petioles 0.4–1 cm long, patent-pilulose; inflorescence 2.5–6 cm long, dense or fairly lax; bracts small or more often rather large, the lower 0.8–2 cm long, 0.6–1.4 cm wide, scarious, ovate or often broad-ovate, subacute or subacuminate, entire or sometimes with solitary teeth, sparsely covered with short appressed hairs, finely punctate-glandular, mostly pale green, rarely suffused with reddish-purple, with prominent longitudinal nerves, very obscurely reticulate; calyx densely covered with short spreading hairs, stipitate-glandular; scutellum to 4 mm long in fruit, sparsely short-hairy; corolla medium to large, 2.5–3 cm long, 6–8 mm wide at throat, yellow, short-hairy and stipitate-glandular outside; nutlets gray with dense appressed pubescence. May–July.

Dry grassy places and pastures, exposed stony and calcareous slopes, clayey bluffs, gravels. — Caucasus: E. Transc. Endemic. Described from Tbilisi. Type in Paris (or London?).

Note. This species varies greatly in the degree of dissection of the leaf blade, and for this reason we have included it twice in the key.

74. *S. sedelmeyerae* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 403. — *S. orientalis* var. *chamaedryfolia* N. Pop. in Mat. fl. Kavk. IV, 3 (1916) 73, p. p. non Rchb.



PLATE IX. 1 – *Scutellaria polyodon* Juz., general aspect, leaf, bract, flower, anther; 2 – *S. platystegia* Juz., general aspect, leaf, bract, flower; 3 – *S. karjagini* Grossh., summit of stem, leaf, bract, flower; 4 – *S. sosnovskiy* Takht., general aspect, leaf, bract, flower, anther, fragment of fruiting inflorescence, nutlets.

Perennial, 10–20 cm high; caudex very short, nodose; stems several to many, ascending, usually curved or slightly flexuous with very short spreading hairs, sometimes slightly lilac-tinged; leaves 0.8–2 cm long, 0.6–1.2 cm wide, ovate-triangular or oblong-ovate, usually truncate at base, acute, pectinately incised (to about half the half-blade width) with 5–7 large remote obtuse or rounded slightly antrorse teeth (to 4 mm long) on each margin, green above, sparsely or densely covered with fine curved hairs, grayish beneath with dense short imperfect tomentum, with distinct slightly prominent yellowish veins; petioles to 1.3 cm long, as long as or usually shorter than blade, covered with short curved hairs; inflorescence 3–7 cm long, at first rather dense, later fairly lax; bracts 1–1.5 cm long, 0.8–1 cm wide (the lower), rhombic, broadly ovate, tapering at both ends, subacute or short-acuminate, densely covered with short or rather long spreading hairs and scattered stipitate glands, pale green or mostly turning dark lilac at least in upper part, the lowermost with few large teeth (to 4 on each margin); calyx densely covered with long spreading white hairs and short-stipitate glands; corolla large, 3–3.7 cm long, 6 mm wide at throat, yellow, with a large brown spot on lower lip, patent-hairy and finely stipitate-glandular. June–July.

Dry mountain slopes. — Caucasus: S. Transc. Endemic. Described from the vicinity of Elenovka. Type in Leningrad.

75. ***S. platystegia*** Juz. in Bot. zhurn. SSSR, XXIV, Nos. 5–6 (1939) 431 (in adnot.). — *S. orientalis* α. *chamaedryfolia* Ldb. Fl. Ross. III (1847–1849) 395, p. p.; N. Pop. in Mat. fl. Kavk. IV, 3, 73, p. p. non Rechb. — Ic.: Grossg. in Izv. Azerb. fil. AN SSSR, 3 (1945), 85, Figure 11.

Subshrub 12–25 cm high, with a short woody branching caudex; stems many, ascending at base, curved or almost straight; leafy shoots and petioles rather densely covered with short spreading slightly crisp hairs; internodes usually elongate; leaves medium to large, 7–23 mm long, 5–20 mm wide, triangular or broadly ovate, with truncate or subcordate base, usually acuminate, rather deeply incised-crenate or dentate with 4–7 long (ca. 3 mm) very uneven slightly spreading usually obtuse teeth on each margin, dark green, rather sparsely appressed-hairy above, softly white- or gray-tomentose beneath, with nerves not usually concealed by tomentum, more or less distinctly netted-veined, the lowermost with petioles to 1.2 cm long, the upper short-petioled to sessile; inflorescence 2.5–5 cm long, dense; bracts broadly ovate, hardly as long as wide, the lower ca. 1.5 cm long, 1.2 cm wide, convex, short-attenuate to subacute at apex, the lowermost few-toothed, the upper entire, sparsely covered with very fine short curved hairs, punctate-glandular, sparingly long-hairy on the margins, greenish or mostly dark purple, netted-nerved; calyx rather densely short-hairy and glandular; corolla medium or fairly large, to 3 cm long, yellow, covered outside with long hairs and short-stipitate glands. April–July. (Plate IX, Figure 2.)

Stony slopes, steppes. — Caucasus: S. Transc. Endemic. Described from Karabakh, between Chai Tumos and Kyagrizami. Type in Leningrad.

Note. Akin to *S. orientalis*; slightly differing in habit and chiefly distinguished by vesture of leaf undersurface.

76. ***S. grossheimiana*** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 405. — *S. prilipkoana* Grossh. in sched. p. p. (nec alibi). — *S. orientalis* var. *chamaedryfolia* et var. *pinnatifida* N. Pop. in Mat. fl. Kavk. IV, 3 (1916) 73 et 79, p. p. non Rechb.

Perennial, 6–18 cm high; stems densely covered with long spreading hairs; internodes generally shorter than in *S. platystegia* Juz., not exceeding leaves; leaves 0.5–2 cm long, 0.4–1.5 cm wide, orbicular or broadly triangular-ovate, obtuse or subobtuse, very deeply (more than half the half-blade width) incised-crenate with 4–7 oblong or broadly linear teeth on each margin, gray-green, densely appressed-hairy above; petioles to 1.2 cm long; inflorescence 2.5–5 cm long, in fruit to 7 cm; bracts more compacted than in *S. platystegia* Juz. pale grayish-green, sometimes slightly purple, more densely covered with slightly longer curved hairs, the inconspicuous minutely stipitate or sessile glands almost concealed; lower bracts 1–1.5 cm long, 1–1.4 cm wide; corolla 2.5–3 cm long, ca. 5 mm wide at throat. Otherwise, similar to *S. platystegia* Juz. May–June.

Dry, mostly stony slopes. — Caucasus: Tal. Endemic. Described from near Lerik. Type in Leningrad.

77. *S. artvinensis* Grossh. in Izv. Azerb. fil. AN SSSR, 10 (1944) 37. — *S. orientalis* var. *pinnatifida* N. Pop. in Mat. fl. Kavk. IV, 3 (1916) 79, p. p. non Rechb. — Ic.: Grossg., op. cit. 3 (1945) 85, Figure 16.

Subshrub 12–25 cm high, caudex long-procumbent, strongly branching, often flexuous; stems usually ascending, curved or slightly flexuous; internodes mostly short; leaves 0.6–2.4 cm long, 0.5–1.8 cm wide, broadly ovate to suborbicular, obtuse, very deeply (to 1/3–2/5 the width of blade) incised-dentate, with 3–8 triangular or digitate often slightly re-
 163 curved obtuse teeth to 5 mm long on each margin, grayish-green, densely appressed-hairy above, white-tomentose beneath, the midrib and lateral veins prominent, not concealed by tomentum; petioles to 1–1.5 cm long; inflorescence 2.5–5 cm long, loose; bracts not compacted, mostly entire, densely patent-hairy and stipitate-glandular, pale green or often purple-tinged, with prominent longitudinal nerves, the lower to 1.3 cm long, 1 cm wide; corolla 2.5–3.5 cm long, rather densely hairy and stipitate-glandular outside. Otherwise, like *S. platystegia* Juz. which it resembles particularly in the vesture of stems and of leaf underside. April–June, again in August.

Taluses, stony bluffs and slopes. — Caucasus: S. Transc.? Gen. distr.: Arm.-Kurd. Described from Artvin district. Type in Baku (or Tbilisi?).

78. *S. karjaginii* Grossh. in Izv. Azerb. fil. AN SSSR, 3 (1945) 81. — *S. improvisa* Grossh. Opred. rast. Kavk. (1949) 327. — *S. rhomboidalis* Grossh. in Bot. mat. gerb. Bot. inst. AN SSSR, XIII (1950) 19, p. p. — Ic.: Grossg., op. cit. (1945) 85, Figure 10.

Subshrub, 8–30 cm high; caudex short, strongly branching; stems many, ascending, erect or slightly curved, simple or somewhat branching, sparsely or rather densely covered with short curved hairs; leaves 0.7–2.5 cm long, 0.5–2 cm wide, triangular-ovate, truncate or obtusely angled at base, obtuse to subacute at apex, coarsely incised-dentate with 5–7 obliquely triangular obtuse teeth on each margin (the teeth not exceeding 1/3, rarely reaching 1/2 of half-blade width), green above, slightly rugose, finely appressed-hairy, densely covered beneath with white or gray appressed tomentum, the midrib and lateral veins often prominent; petioles tomentose-hairy, to 1.5 cm long; inflorescence 3–4 cm long, in fruit to 10 cm, rather dense; bracts medium to fairly large, 0.8–1.4 cm long, 0.5–1.1 cm wide, rhombic-ovate, with 2–4 triangular large teeth on each margin or the upper entire, diffusely covered with short hairs, with rather long spreading hairs on the margins, slightly

stipitate-glandular, mostly pale green, sometimes turning lilac; corolla 2.5–3 cm long, 4–5 mm wide, short-hairy and stipitate-glandular outside, bright yellow, the lower lip darker (brownish); nutlets ca. 1.5 mm long, angled, densely covered with appressed white hairs. April–June. (Plate IX, Figure 3.)

Dry stony and rocky slopes, pebbles in the middle and lower mountain belts. — Caucas.: S. Transc. **Gen. distr.:** Iran (?). Described from Aznabyurt (Nakhichevan ASSR, Nakhichevan district). Type in Baku, paratypes and topotypes in Leningrad.

Note. The synonymy cited indicates how vague the author himself was concerning this species. It should also be noted that Grossgeim referred the more mesophytic specimens of *S. karjaginii* to *S. sevanensis* Sosn. (in herbarium of the Botanical Institute of the Academy of Sciences of the USSR).

79. ***S. rhomboidalis*** Grossh. Opred. rast. Kavk. (1949) 328 (rossice); Grossg. in Bot. mat. gerb. Bot. inst. AN SSSR, XIII (1950) 19, sensu restricto.

Perennial, 12–22 cm high, similar on the whole to *S. karjaginii* but leaves (especially the upper) mostly elongate; bracts smaller, 6–11 mm long, 3–8 mm wide, acute or acuminate, entire or the lower often with few small teeth on the margin, green, diffusely tomentulose, the tomentum intermixed with few short straight hairs, these more abundant on the margins; inflorescence 3–8 cm long (apparently elongating after flowering); corolla 2–2.5 cm long, with slender tube. May–July.

Pebble beds. — Caucasus: S. Transc. (Nakhichevan ASSR). Endemic. Described from Norashen district, estuary of Kabakhly-Chai River near Dize. Type in Leningrad.

Note. This is apparently an “interserial” hybrid, intermediate between *S. karjaginii* Grossh. and *S. araxensis* Grossh. We accepted as its type one of Grossgeim’s “isotypes” (i.e. duplicates of type) because it appeared to us that the specimen he recorded as the type was none other than *S. karjaginii* Grossh. which occurs in the location indicated together with *S. rhomboidalis*. As far as *S. araxensis* Grossh. is concerned, it was not collected here and, generally speaking, *S. rhomboidalis* appears to be a completely fixed form (we refer to it specimens preserved in the Botanical Institute of the Academy of Sciences of the USSR that were collected by T. Heideman from an entirely different locality — near the village of Bichenakh).

80. ***S. prilipkoana*** Grossh. in Izv. Azerb. fil. AN SSSR, 3 (1945) 82. — *S. orientalis* var. *pinnatifida* N. Pop. in Mat. fl. Kavk. IV, 3 (1916) 79, p. p. non Rechb. — **Ic.:** Grossg., op. cit. 85, Figure 13.

Perennial, 8–25 cm high; caudex procumbent, flexuous, branching; stems many, ascending, simple or branching, curved or flexuous, densely covered (like petioles) with long spreading crisp hairs, often turning lilac; leaves 0.5–1.5 (2) cm long, 0.4–1.4 cm wide, ovate to broad-ovate, truncate or arched-incurved at base, obtuse to subacute, deeply (to 1/3–2/5 width of blade) pinnatifid, with 4–6 nearly horizontally spreading or commonly obliquely antrorse, oblong or linear, obtuse teeth or lobules to 6 mm long at each side, grayish-green, densely covered with fine crisp hairs above, grayish with dense soft spreading tomentum beneath, the veins distinct but not prominent; inflorescence 3–4 cm long, lax or sometimes initially dense; bracts 1–1.5 cm long, 0.7–1 cm wide, ovate to broad-ovate, short-acuminate, entire, the lower often with a few teeth, rather densely soft-hairy, slightly

glandular, pale green or sometimes lilac; corolla 2.4–3 cm long, 4–5 mm wide at throat, bright yellow, soft-hairy and glandular outside. May–August.

Dry stony and rocky slopes. — Caucasus: Tal. Endemic. Described from Kosmodal'-yan in Zuvand. Type in Baku.

Note. The species is close to the Iranian *S. mucida* Stapf, but differs in having mostly entire bracts.

81. ***S. darriensis*** Grossh. in Izv. Azerb. fil. AN SSSR, 3 (1945) 83. — **Ic.:** Grossg., op. cit. 85, Figure 17.

Perennial, 15–30 cm high; stems many, ascending; leaves 1–2 cm long, ovate, cut nearly to base into 4–5 linear obtuse lobes ca. 2 mm wide, green, finely pubescent above, gray, finely crisp-hairy beneath; bracts 1–1.5 cm long, 5–8 mm wide, ovate-rhombic, acute, with 2–3 rather large triangular acute teeth on each margin, rather densely puberulent; corolla 2.5–3 cm long, 4–5 mm wide at throat, yellow. July (?).

Rocky places in the lower mountain belt. — Caucasus: S. Transc. **Gen. distr.:** N. Iran? Described from Darri-Dagh Mountains. Type in Baku.

Note. We have not seen specimens of this species and we have borrowed its very brief description from the work of Grossgeim.

82. ***S. sosnovskyi*** Takht. in Zam. po sist. i geogr. rast. izd. Gruz. fil. AN SSSR, 9 (1940) 24. — *S. orientalis* α . *pinnatifida* Rchb. **Ic. pl. crit.** I (1823) 10 (non *S. pinnatifida* A. Hamilt.); N. Pop. in Mat. fl. Kavk. IV, 3, 79, p. p. — **Ic.:** Rchb. l. c. tab. VIII, fig. 16; Grossg. in Izv. Azerb. fil. AN SSSR, 3 (1945) 85, Figure 14.

Perennial, low-growing, producing small tufts; caudex procumbent, woody, branching; flowering and sterile shoots numerous, ascending, leafy, 5–15 cm long, covered with short spreading crisp hairs; leaves 5–25 mm long, 2.5–12 mm wide, elliptic or oblong, usually 166 truncate at base, deeply (2/5–3/7 the width of blade, sometimes nearly to midrib) pinnatisect into 4–7 horizontal or slightly antrorse linear or narrowly linear obtuse teeth or segments on each margin, sometimes with one long tooth, green, usually with scattered short hairs above, grayish or whitish beneath with copious short appressed or spreading tomentum, the veins prominent or often indistinct; petioles usually long, slender, patent-tomentose, 0.3–2 cm long; inflorescence loosely spicate, 2.5–5 cm long; bracts 8–13 mm long, 3–6 mm wide, narrowly ovate or ovate-lanceolate, tapering to base and sessile, obtuse or acute, the lower often with 1–2 teeth per margin, rather densely covered with long spreading hairs and scattered short-stipitate glands; calyx densely patent-hairy and glandular; corolla 2.5–3 cm long, ca. 7 mm wide in throat, yellow, hairy and stipitate-glandular outside. August. (Plate IX, Figure 4.)

Steppes and steppe slopes, stony mountain meadows, rocks, taluses. — Caucasus: E. Transc. (Borzhomi and Akhaltsikhe), S. Transc. (western part of Armenian SSR). **Gen. distr.:** Arm.-Kurd. Described from Amass district, Kaikuli. Type in Erevan.

83. ***S. amphichlora*** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 411.

Subshrub, 5–22 cm high; caudex low, woody, branching; stems leafy, ascending, sparingly branching, slightly flexuous, pale, woody in lower part, sparsely covered with short curved hairs interspersed with short-stipitate glands; leaves 0.5–2 cm long, 0.5–1 cm wide,

ovate, with truncate or obtusely angled base, obtuse at apex, pale green on both sides, sparsely or beneath more densely short-hairy with intermixed (sometimes abundant) short-stipitate glands, the pinnatisect-dentate margins with obliquely antrorse teeth or segments, these half of half-blade width or usually slightly longer, oblong or broadly linear, usually rounded at the ends; petioles patent-hairy and stipitate-glandular, 0.2–1.5 cm long; inflorescence 2.5–5 cm long; bracts 0.6–1.4 cm long, 0.3–0.8 cm wide, ovate to ovate-lanceolate, obtuse or sometimes acuminate, entire or the lowermost with few acute teeth, sparsely covered with long hairs and stipitate glands, pale green or slightly colored; corolla 2–3 cm long, 4–6 mm wide at throat, yellow, often with a brown spot at the center of lower lip, covered outside with short hairs and stipitate glands. July.

- 167 Dry mountain slopes and pastures (2400–2800 m). -- Caucasus: S. Transc. (Aragats Mountain). Described from Aragats Mountain, Dali-Chai River. Type in Leningrad.

Note. On establishing this species we submitted the notion that it derived from a crossing of *S. sosnowskyi* Takht. with a member of the series *Sevanenses* Grossh. from the next subsection. It is possible that *S. amphichlora* derives directly from *S. sosnowskyi* Takht.

84. *S. araratica* Grossh. in Izv. Azerb. fil. AN SSSR, 3 (1945) 84. -- *S. orientalis* var. *pinnatifida* N. Pop. in Mat. fl. Kavk. IV, 3 (1916) 79, p. p. non Rechb. -- Ic.: Grossg., op. cit. 85, Figure 18.

Perennial, 7–10 cm high, with procumbent, rooting rhizome; stems ascending, sparsely covered with short spreading hairs, pale green; leaves small, 4–15 mm long, 2–7 mm wide, broadly ovate or oblong-ovate, usually truncate at base, obtuse or acute, very finely appressed-hairy above, sparsely gray-tomentose beneath, very deeply pinnatifid-dentate with 4–7 teeth on each margin, these long, narrow, obtuse oblong or linear, apically rounded, often to middle of half-blade and commonly 1/3 the width of blade; petioles slender, to 1.2 cm long, nearly the length of blade, sparsely patent-tomentose; inflorescence dense, ovate, 2.5–3.5 cm long; lowermost bracts large, 1–1.5 cm long, 5–7 mm wide, oblong-ovate, acuminate, in upper part with 3–5 triangular teeth at each side; middle bracts smaller, 0.6–1 cm long, 3–4 (5) mm wide, entire or rarely with 1–2 teeth above; all bracts short-patent-hairy and stipitate-glandular; corolla ca. 2.5 cm long, 5–6 mm wide at throat, yellow, pubescent and short-stipitate-glandular outside.

Caucasus: S. Transc.? **Gen. distr.:** N. Iran. Described from Great Ararat peak near Sardar-Bulak (from Khodz'ko specimens). Type in Leningrad.

Note. It is possible that this species, provisionally included in "Flora of the USSR," does not occur within the Soviet Union.

Series 2. *Adenostegiae* Juz. — True subshrubs, with shoots strongly lignified in lower part; vestiture of bracts consisting mainly of large long-stipitate glands clearly visible even under low magnification.

- 168 Note. The species of this series are very closely related to each other, while their affinity to species of the preceding series is much less evident; they may in fact be of different derivation. Whereas the *Eu-platystegiae* are clearly connected phylogenetically with the *Oxystegiae*, the series *Adenostegiae* may have, in our view, originated directly from species

of the series *Multicaules*, or, rather, from its progenitor, as evidenced by the proximity of verticillasters in the inflorescence (for example, a species such as *S. gontscharovii* Juz. which is very close to *S. juzepeczukii* Gontsch.). Should our assumption be confirmed by further investigation, the taxonomic position of the series *Adenostegiae* would have to be changed.

85. *S. adenostegia* Briq. in Bot. Tidskr. 28 (1908) 233.

Perennial; root robust, woody, oblique or vertical, branching; stems mostly numerous, 12–32 cm high, ascending or erect, branching at base, usually simple above, subvirgate, usually cinereous, with copious short partly crisp hairs, often slightly suffused with lilac in lower part; leaves rather small, 0.6–2.5 (3) cm long, 0.3–2 cm wide, ovate or the upper almost triangular, at base truncate, subcordate or slightly tapering to petiole and obtusely angled (the upper obtuse or often acute at base), deeply and often rather regularly crenate with 5–10 crenations 1–2 mm long on each margin, rugose, green above with scattered short fine hairs or often grayish with sparse very fine appressed tomentum, appressed-white- or cinereous-tomentose beneath, with very prominent midrib and lateral veins, these spreading flabellately from base; petioles dilated, slightly winged, tomentose, 0.1–1 cm long, half the length of blade; inflorescence 4–10 cm long, loose; bracts to 1.3 cm long, 1.5 cm wide, broadly ovate, short-apiculate, sometimes (especially the lower) slightly crenulate, mostly prominently netted-nerved, sparsely covered with distinct long-stipitate glands intermixed with long simple hairs, usually pale green; calyx at anthesis small, 3–4 mm long, glandular-hairy, viscous; corolla large, to 3–3.5 cm long, glandular-hairy outside, yellow; lower lip usually with purple lateral lobes. May–July. (Plate X, Figure 3.)

Stony and clayey mountain slopes and outcrops, dry riverbeds and streams, stony placers and pebbles along banks of rivers. Centr. Asia: T. Sh. (Susamyr Range), Pam.-Al. (Alai Range, Turkestan Range, Zeravshan). Endemic. Described from the southern slope of Alai Range near Gul'chi. Type in Copenhagen, isotype (Paulsen, No. 386) in Leningrad.

169 86. *S. bucharica* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 406.

Perennial; stems often few, 12–28 cm long, ascending at base and very often branching above, covered with short spreading curved or crisp hairs, often turning lilac, sometimes only at base; leaves medium to large, 0.6–3 cm long, 0.5–2.5 cm wide, broadly ovate, at base usually shallowly cordate, rounded or obtuse at apex, rather shallowly and coarsely crenate with 4–8 rounded crenations on each margin, green or often grayish-green, very finely appressed-tomentose above, densely white- or gray-tomentose beneath, the veins mostly not prominent but not completely concealed by tomentum, hence network of veins usually distinct; inflorescence 2.5–4 cm long at first, considerably elongating after flowering and reaching 10 cm; bracts to 12 mm long, 10 mm wide, covered with long eglandulose hairs and often less numerous stipitate glands, subacuminate or subacute at apex, pale green, often turning lilac; corolla medium-sized, 1.5–2.5 cm long, bright yellow, with brownish lower lip; nutlets to 2 mm long, whitish, densely pubescent. Otherwise, similar to *S. adenostegia* Briq. May–June.

Clayey and stony mountain slopes, granite outcrops, riverbanks. Centr. Asia: Pam.-Al. (within borders of Tadzhikistan). Endemic. Described from Chul'bair Mountains near Ak-Su village and from Babatag Range (northeastern tip), north of Dzhambulak village. Type and paratype in Leningrad.

87. **S. gontscharovii** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 407.

Perennial; stems few, 10–35 cm long, ascending, rather sparingly and shortly pubescent, more or less lilac; leaves 0.7–2.4 cm long, 0.5–1.6 cm wide, broadly ovate or nearly rhombic, with rounded or obtusely angled to rectangular base, usually subacute, incised-crenate with (3) 4–7 crenations to 3 mm long on each margin, green with scattered hairs and impressed veins above, grayish beneath with sparse slightly spreading tomentum, the violet coloration of the leaf undersurface showing more or less clearly through the tomentum (as in *S. haematochlora* Juz.), the veins not or slightly prominent; petioles hairy, to 1 cm long; inflorescence 3–6 cm long, loose; bracts 0.8–1.3 cm long, 0.5–0.9 cm wide, short- or long-acuminate, lower bracts finely dentate, those above them with isolated small teeth, rather copiously but not evenly covered (mainly along margins and midrib) with simple, long, spreading hairs and numerous large stipitate and sessile glands; corolla 2–3 cm long, completely yellow or in rare cases the upper lip and its appendages red. Otherwise, like *S. adenostegia* Briq. and *S. bucharica* Juz. May–June.

Stony mountain slopes. — Centr. Asia: Pam.-Al. (S. Tadzhikistan). Endemic. Described from Kulyab region, near Arzanchi village. Type in Leningrad.

88. **S. haematochlora** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 408, s. str.

Subshrub with sturdy woody flexuous caudex; stems rather numerous, 15–35 cm long, woody in lower part, procumbent or ascending, often rooting at nodes and strongly branching, producing many ascending or suberect shoots, these sparsely covered with short curved or slightly crisp hairs, often lilac; leaves medium to fairly large, 0.7–4 cm long, 0.4–3 cm wide, broadly ovate or ovate-rhombic, with rounded or usually angled (broadly cuneate) base, tapering to petiole, obtuse to subacute at apex, incised-crenate-dentate with 4–10 rather large uneven obtuse or subacute or sometimes acute teeth on each margin, green above, glabrous or covered with very fine faintly discernible sparse or rather dense hairs, usually sparsely short-tomentose beneath, often lilac between the veins, these densely pubescent, yellowish, very distinct against the background of anthocyanin coloring and tomentum; petioles usually well developed, even in upper leaves, 0.2–1.5 cm long, pubescent; inflorescence 2–4 cm long, in fruit to 10 cm; bracts dark green, the lower being 1–1.6 cm long and 0.6–1 cm wide, ovate or rather broadly ovate, gradually or (especially the lower) abruptly long-acuminate, often terminating in a slightly curved point, usually with sparse simple long hairs and numerous stipitate glands only on the margins and nerves, otherwise sparingly pubescent and glandular; calyx at anthesis ca. 2 mm long, hairy and glandular; corolla 1.5–2.5 cm long, yellow, often with purple or dark spot on lower lip, covered outside with short-stipitate glands; nutlets ca. 1.5 mm long, whitish, densely pubescent. May–July.

Stony, mostly grassy mountain slopes. — Centr. Asia: T. Sh. (western part, mainly along valleys of right-hand tributaries of Chatkal River). Endemic. Described from Aktash forest district near Tashkent (in southern Kazakhstan) and from Bol'shoi Chimgan. Type and paratypes in Leningrad.

Note. A unique plant, collected by Z.A. Minkvits in the Ugam River valley, is allied to *S. haematochlora*, but differs from it in the smallish leaves and, in particular, the narrower, ovate-lanceolate, gradually acuminate, pale green bracts, covered with very short, appressed and curved hairs interspersed with small, very short-stipitate or subsessile glands,

and in the flowers up to 2 cm long. We suspect that this plant is a hybrid (*S. haematochlora* s.l. \times *S. microdasys* Juz.) and we have named it *S. minkwitziae* Juz. (p. 346).

89. *S. tschimganica* Juz. sp. nov. in Addenda XIX, 346. — *S. haematochlora* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 408, p. p.

Perennial; close to preceding species but differing in the following characters: plant lower, 7–25 cm high; leaves smaller and narrower, to 2 cm long, 1.4 cm wide, ovate or narrowly rhombic, cuneate at base, with 3–7 teeth on each margin, very sparingly short-tomentose beneath (some leaves subglabrous); petioles shorter; inflorescence 2–3 cm long, up to 4 cm in fruit, loose; bracts narrowly ovate, gradually tapering to a mostly straight point, very sparingly pubescent between nerves or subglabrous. Otherwise, like *S. haematochlora* Juz. May–June. (Plate X, Figure 4.)

Stony, dry and grassy mountain slopes. — Centr. Asia: T. Sh. (western part: Chimgan and right bank of Central and Upper Angren). Endemic. Described from Bol'shoi Chimgan. Type in Leningrad.

90. *S. urticifolia* Juz. et Vved. in Addenda XIX, (p. 346).

Perennial; caudex and bases of stems woody; annotinous shoots suberect, pale green or pale violet, covered with fine curved hairs; leaves 1–3.2 cm long, 0.6–1.8 cm wide, ovate, with broadly cuneate base, acute at apex, coarsely incised-crenate-dentate with 5–7 obliquely antrorse teeth on each margin, green on both sides, glabrous above, faintly tomentulose or sometimes glabrescent beneath, without a trace of anthocyanin coloration; petioles 1–8 mm long, slightly tomentose, eglandulose; inflorescence ca. 4 cm long, in fruit to 7 cm, rather dense; bracts pale green, rather small, usually to 1 cm long and wide, broadly ovate or suborbicular, shortly and abruptly acuminate, the lower often remotely dentate, copiously covered with long spreading simple hairs and much shorter stipitate glands; corolla yellow, short-stipitate-glandular outside, with broad tube. June.

Slopes of hills, on clayey gravelly soil. — Centr. Asia: T. Sh. (western part: foothills of Fergana Range). Endemic. Described from the vicinity of Gava village. Type in Tashkent.

91. *S. iskanderi* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 410.

Subshrub; stems procumbent, woody, 12–30 cm long, branching above, producing low antrorse leafy tomentose shoots; leaves small, 4–12 mm long, 2–10 mm wide, ovate to suborbicular-ovate, with 2–5 rather deeply incised unequal often acute teeth on each margin, gray, tomentose above with impressed veins, gray- or white-tomentose beneath, the veins not prominent, sparingly pubescent and hence distinctly visible; petioles 1–8 mm long; inflorescence 2–4 cm long; bracts small, to 1 cm long, 6 mm wide, rhombic-elliptic, obtuse or acute, more or less violet, with prominent longitudinal nerves; corolla 2.2–3 cm long, yellow, the upper lip with purple lobes. Otherwise, like *S. adenostegia* Briq.; it probably represents a high-mountain race of that species. May–July.

Dry stony slopes (in Central Asian juniper zone). — Centr. Asia: Pam.-Al. (basin of Zeravshan). Endemic. Described from Iskander Lake (Iskander-Kul'). Type in Leningrad.

92. *S. pycnoclada* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 411.

Perennial; very similar to preceding species but the whole plant more compact, with

(173)

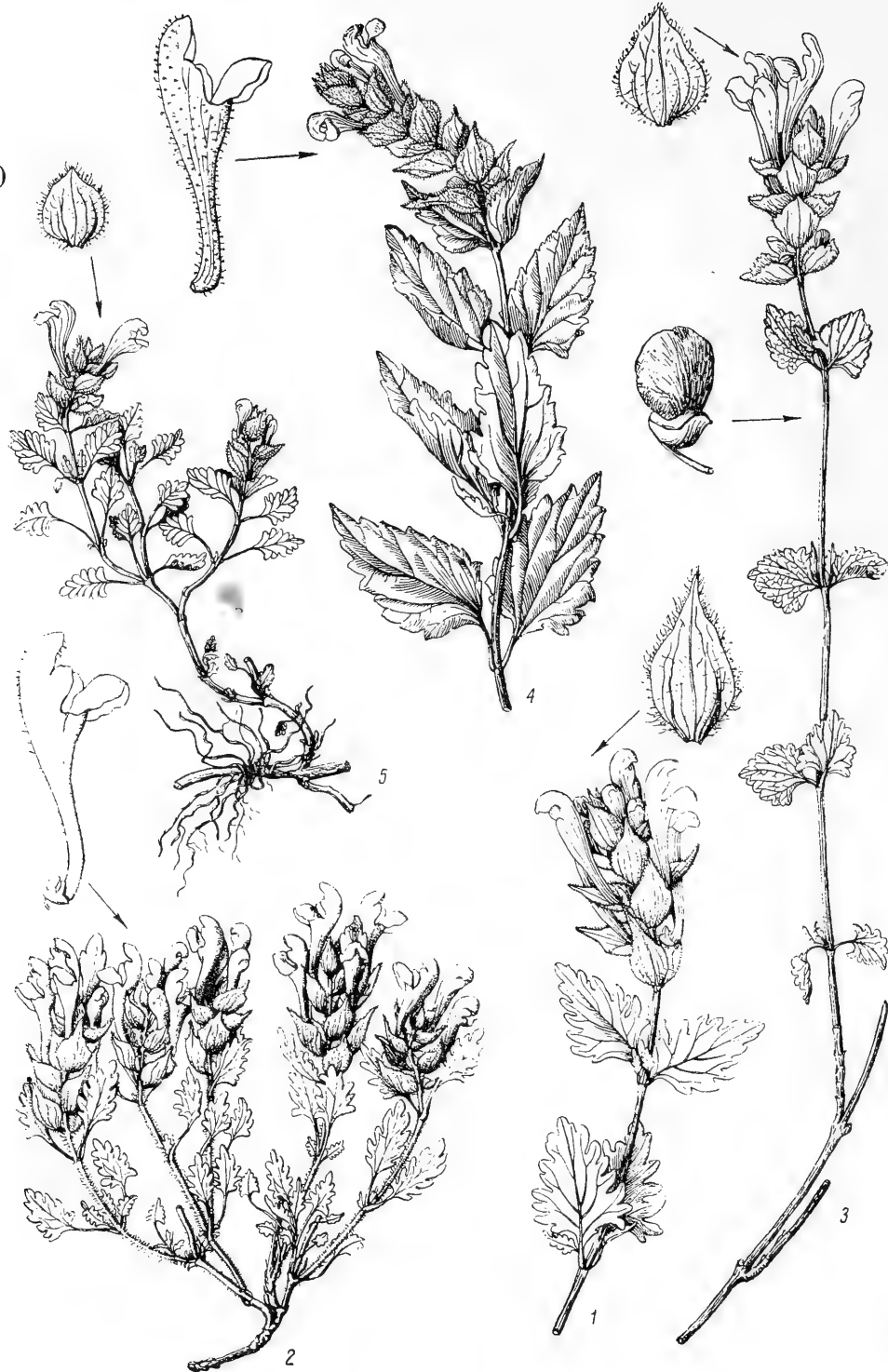


PLATE X. 1 - *Scutellaria transiliensis* Juz., summit of stem, bract; 2 - *S. sieversii* Bge., general aspect, flower; 3 - *S. adenostegia* Briq., general aspect, bract, fruiting calyx; 4 - *S. tschimganica* Juz., summit of stem, corolla; 5 - *S. pycnoclada* Juz., general aspect, bract.

crowded shoots; leaves smaller and more regular, less deeply toothed, often with very prominent veins on the underside; bracts slightly wider and more obtuse, often colorless; smaller flowers 1.5–2.5 cm long, plain yellow. June–July. (Plate X, Figure 5.)

Mountain slopes, dry riverbanks, bottom of gorges. — Centr. Asia: T. Sh. (western part). Endemic. Described from upper reaches of Chatkal River (in southern Kirghizia). Type in Leningrad.

175 93. *S. angrenica* Juz. et Vved. in Addenda XIX, 347.

Perennial; similar to *S. pycnoclada* Juz., but shoots more erect, with longer and looser (sometimes spreading) hairs; leaves narrower, with narrower cuneate base, acute at apex, more densely pubescent above, the margins not revolute, with more deeply incised acute obliquely antrorse teeth; bracts narrower and more acute; corolla small, ca. 2 mm long, stipitate-glandular outside. Otherwise, like *S. pycnoclada* Juz. June.

Stony and gravelly slopes, dry stony-sandy hillocks, quackgrass steppes. — Centr. Asia: W. T. Sh. (basin of Angren River, especially along its left bank). Described from the northern slope of Kuramin Range, Lyailak-Sai. Type in Tashkent.

Subsection 4. *Alpinae* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 363. — Shrubs, subshrubs or perennial herbs; leaves green or grayish-green on both sides, rather sparingly or densely covered with simple straight or slightly crisp hairs (sometimes with intermixed stipitate glands), but always without true tomentum; inflorescence spikelike, uninterrupted; bracts broad, ovate or elliptic, scarious or sometimes subherbaceous; corolla-tube usually rather short and wide, abruptly dilated at throat; lower lip of corolla mostly rather short, as long as or shorter than the upper lip.

Series 1. *Cordifrondes* Juz. — Small shrubs; vesture of stems and leaves including long-stipitate glandular hairs; lower lip of corolla not hairy above.

94. *S. cordifrons* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 363. — *S. alpina* var. *cordifolia* Rgl. in Tr. Bot. sada, VI (1879) 365. — *S. cordifolia* O. Fedtsch. in O. and B. Fedch. Perech. rast. Turk. V (1913) 158, non Benth. nec Mühlenb.

Low, erect or sometimes nearly prostrate shrub 12–40 cm high, with branching flexuous nodose brownish-gray stem; leafy branches with long internodes, densely covered with horizontally spreading long coarse simple and glandular hairs; leaves 0.7–2.7 cm long, 0.6–3 cm wide, cordate or cordate-reniform, with broadly cordate or truncate base, subobtusely to obtuse, often rounded at apex, unevenly and coarsely crenate with 4–10 teeth (to 1–3 mm) on each margin, yellowish-green on both sides, covered sparsely or rather densely above, usually densely beneath, with fairly simple stiff long hairs and large stipitate glands, rugose above, prominently veined beneath; petioles 0.3–1.4 cm long, densely patent-hairy and glandular, approximately half as long as blade; upper leaves subsessile; inflorescence 2–6 cm long, at first rather dense, later loose; bracts to 1–1.4 cm long, 0.6–1.2 cm wide, subherbaceous, short-elliptic, slightly pointed at both ends, with few or solitary teeth or (the upper) entire, nearly flat, green, rather densely covered, especially on nerves and

margins, with long simple and glandular hairs; calyx to 3 mm long at anthesis, densely patent-hairy and stipitate-glandular; corolla small, 1.5–2.5 cm long, with a broad tube, densely stipitate-glandular outside, yellow, the tip and lobes of upper lip purple and the lower lip with a purple spot (sometimes completely purple); nutlets 1–1.5 mm long, angled, gray, covered with very fine stellate hairs. July–August. (Plate XI, Figure 6.)

Rocks and stony placers in subalpine and alpine mountain belts, sides of ravines. — Centr. Asia: W. T. Sh. Endemic. Described from Aktag-Tau Range (Korol'kov collections). Type in Leningrad.

Series 2. *Adsurgentes* Juz. — Like the preceding series, but vesture of stems and leaves without glandular hairs or with rather short-stipitate glands; lower lip of corolla pubescent above.

95. *S. adsurgens* M. Pop. in Bot. mat. gerb. Bot. sada, V, 10 (1924) 154.

Shrub, 20–40 cm high; stem erect or often procumbent or ascending, branching from base or slightly above base; old shoots stout, straight or flexuous, woody, glabrous, with brown bark, with remnants of previous year's petioles at nodes; young shoots 5–10 cm long, leafy or floriferous, densely covered with short spreading slightly crisp hairs; internodes of medium length; leaves 0.8–2 cm long, 0.1–1.5 cm wide, ovate or oblong-ovate, broadly cuneate or truncate or subcordate at base, acuminate, coarsely and subacutely dentate with (3) 4–6 teeth (1) 1.5–3 mm high on each margin, green on both sides, subglabrous or sparsely covered above, more densely beneath, with rather short curved hairs interspersed with very small stipitate glands, the veins rather strongly impressed above, 177 very prominent beneath; petioles 0.5–1 cm long, slender, often densely hairy; inflorescence 1–3.5 cm long, to 6 mm in fruit; bracts loosely disposed, elliptic or oblong-elliptic, pointed at both ends, except for the lowermost usually entire, almost flat, green, rather densely covered with simple long hairs and rather long stipitate glands, prominently nerved, the lower ca. 1 cm long, 4 mm wide; calyx to 3 mm long at anthesis, hairy and glandular, with large scutellum; corolla small, 12–16 mm long, densely covered outside with stipitate glands, yellow; lower lip purple-red with a yellow spot at middle, pubescent above (sometimes only at throat); nutlets ca. 1 mm long, cinereous with stellate hairs.

Mountains, at the upper limit of Central Asian juniper zone. — Centr. Asia: T. Sh. (Kara-Tau, Talass Ala-Tau, Ugam mountains). Endemic. Described from Ugam Mountains (near Tashkent), Kovak-Ata survey mark. Type (M. Popov, No. 1282) in Tashkent.

Note. The most typical specimens of this plant occur in the Kara-Tau and Talass Ala-Tau mountains. Before we became acquainted with the description and the type of *S. adsurgens* M. Pop., we had named the Kara-Tau plant in schedis *S. dendroides* Juz., and this name is still to be found in some herbaria. It was with some doubt that we identified the Tashkent plant described by Popov with the Kara-Tau (and Talass) specimens, although it gravitates somewhat toward the next species, described from Gissar Range but apparently also widespread in West Tien Shan.

Economic importance. A high quality dyestuff (aqueous extraction imparts a golden-yellow color to wool and silk).

96. *S. phyllostachya* Juz. in Bot. mat. gerb. Bot inst. AN SSSR, XIV (1951) 364. —
Ic.: Yuz., op. cit. 365, Figure 1.

Shrub; 12–35 cm high, with ascending or procumbent branching stem; old shoots slender or fairly stout, mostly flexuous, woody, with gray or brown bark, nodose; young shoots leafy or floriferous, patent-hairy, usually short-stipitate-glandular; internodes medium to very long; leaves medium-sized, 3.5–20 mm long, 4–15 mm wide, broadly ovate to orbicular, subcordate or truncate, rarely broadly cuneate at base, obtuse or rounded at
178 apex, coarsely and unevenly crenate with 2–5 (7) obtuse teeth 0.5–2 (3) mm high on each margin, green on both sides and covered, more densely beneath, with short crisp hairs interspersed with short-stipitate glands; petioles 0.2–1.7 cm half as long to as long as blade, patent-hairy and stipitate-glandular; inflorescence 2–5 cm long, loose; bracts to 1.5 cm long, 1 cm wide, broadly ovate or elliptic, obtuse to subacute, green, foliaceous, the lowermost pair usually resembling cauline leaves and distinguished only by the very short petioles and reduced crenations, these gradually disappearing toward summit though sporadically occurring even in upper bracts, the margins and midrib beset with long hairs; calyx ca. 3 mm long, sparsely long-hairy and short-glandular; corolla rather large, 2–3 cm long, sparsely long-hairy and short-glandular; corolla rather large, 2–3 cm long, yellow or pinkish, sparingly pubescent and densely glandular outside; upper lip slightly longer than the lower; nutlets to 1.5 mm long, angled and broadly ovoid, gray. June–July.

Subalpine mountain belt. — Centr. Asia: T. Sh. (western part), Pam.-Al. (Tadzhikistan). Endemic. Described from the watershed between Unou and Lyuchob on Gissar Range. Type in Leningrad.

Series 3. *Sevanenses* Grossh. in Izv. Azerb. fil. AN SSSR, 3 (1943) 83. — Like the preceding series but structurally the corolla approaches the type characteristic of the subsection *Orientales* Juz.; lower lip glabrous.

97. *S. sevanensis* Sosn. in Grossg. Fl. Kavk. III (1932) 286. — Ic.: Grossg. in Izv. Azerb. fil. AN SSSR, 3 (1945) 85, Figure 15.

Low-growing, prostrate or ascending shrub 8–25 cm high, the rough branching trunk covered with brown bark and producing numerous leafy elongate fertile and short sterile green shoots or branches, these sparsely covered with short curved hairs interspersed with short-stipitate glands; leaves 0.7–2 cm long, 0.4–1.5 cm wide, ovate, obtusish or obtusely angled at base, obtuse at apex, with 4–6 semi-elliptic or oblong obtuse teeth on each margin, green on both sides, very finely sparsely or densely pubescent and glandular but never white-tomentose beneath; petioles slender, 0.2–1 cm long, pubescent and glandular; inflorescence 3–5.5 cm long, dense at first, becoming lax; lower bracts rather large, 1–1.6 cm long, 0.7–1 cm wide, rhombic-ovate, attenuate at both ends, acutish or short-acuminate at
179 apex, entire, with prominent longitudinal nerves, covered with short spreading hairs and short-stipitate glands, green, often violet-tinged at apex; calyx ca. 2 mm long at anthesis, densely stipitate-glandular; corolla 2–2.7 cm long, pale yellow, with broad tube to 7 mm broad at throat, relatively short upper lip and large lower lip, covered outside with short spreading hairs and glands. June–August.

Meadows and pastures, rocks and stony places in upper (alpine and subalpine) mountain

belts. — Caucasus: S. Transc. (near Lake Sevan, Zangezur, Nakhichevan ASSR). Endemic. Apparently described from the vicinity of Tazakend (formerly Novobayazetskii district). Type (or paratype?) in Leningrad.

Note. We believe that this species is very closely allied to *S. virens* Boiss. et Ky., described from Lesser Armenia; thus Grossgeim's proposed name for the series in which the species is included cannot be regarded as a good choice.

Series 4. *Supinae* Juz. — Perennial herbs, more or less mesophytic in habit; leaves rather sparingly pubescent, and numerous (commonly 7-11 per margin, rarely less) mostly very distinct teeth; bracts rather loosely disposed.

98. *S. verna* Bess. Prim. fl. Galic. II (1809) 43; Yuz. in Tr. N.-d. inst. bot. IV, 206. — *S. alpina* β. *lupulina* Ldb. Fl. Ross. III (1847-1849) 394, p. p. — Exs.: Pl. pol. exs. No. 259 (nom. *S. lupulina* L.).

Subshrub, with woody crooked root; stems few, 10-30 cm high, ascending at base, generally curved or slightly flexuous, simple or often branching, usually pale violet, except for lower part densely covered with fine white reclinate hairs, at summit and in inflorescence densely stipitate-glandular and patent-hairy; leaves medium-sized, 1.2-2.3 cm long, 0.5-1.5 cm wide, narrowly ovate or usually ovate, approximately twice as long as wide, usually truncate, rarely rounded or slightly tapering at base, mostly obtuse at apex, covered above with minute hardly discernible spreading hairs, copiously glandular-punctate beneath, with prominent, very finely pubescent veins, evenly and regularly crenate-dentate with 5-7 obtuse rather high and slightly spreading teeth on each margin, the outer margin of each tooth much longer than the inner; petioles of lower leaves to 1 cm long, of median ca. 5 cm, those of upper leaves much shorter (leaves subsessile); petiole and margin of blade at base with fine and rather long, horizontally spreading or recurved hairs (seemingly ciliate); inflorescence ca. 2 cm long at first, later ca. 9 cm, with flowers in loosely dis-
180 posed verticillasters; bracts early deciduous, broad-ovate or ovate, the lower 1-2 cm long, 0.8-1.2 cm wide, gradually tapering at apex to a short or longish point, almost scarious, pale green or very often suffused with lilac, glandular, long-ciliate at margin, the nerves slightly prominent; calyx at anthesis ca. 2 mm long, densely hairy and glandular; corolla small or often large, 1-2.5 cm long, yellow, densely hairy and glandular outside. July — August.

Limestone outcrops. — European part: M. Dnp. (western part), U. Dns. Gen. distr.: ? Centr. Eur. (Hungary). Described from Zaleshchiki on the Dniester. Type (or isotype) in Leningrad.

Note. The identity of the Hungarian (Transylvanian) plant with *S. verna* Bess. is doubtful and in any case needs verification. Its flowers are apparently larger than those of the true *S. verna* from Podolia and its bracts do not fall quite so early. It was published: Dörfler, Herb. norm. No. 5154 (under the name *S. supina*).

99. *S. cretica* Juz. in Tr. N.-d. inst. bot. IV (1941) 205. — *S. alpina* β. *lupulina* Schmalh. Fl. II (1897) 327, p. p.

Subshrub, with woody flexuous and nodose root; stems many, 10-25 (30) cm high, at base usually ascending or rarely suberect, usually curved or slightly flexuous, simple or

often short-branching, covered (except at base) with fine white retrorse curved hairs, in inflorescence densely stipitate-glandular and short-patent-hairy; leaves glabrous above, densely glandular-punctate beneath, very finely pubescent on the prominent veins, medium-sized, 1–3 cm long, 0.3–1.2 cm wide, ovate or usually narrowly ovate or even ovate-lanceolate, approximately twice as long as wide, mostly truncate, rarely rounded or slightly tapering at base, unevenly and shallowly toothed, acute and entire at apex, the uppermost leaves often nearly entire, with 5–7 teeth on each margin, in lower leaves the teeth often crenately rounded at apex, in others nearly rectangular, asymmetrical, the outer margin much longer than inner and nearly parallel to leaf margin and hence the teeth very low; petioles short, in lower leaves to 7 mm long, in middle leaves 2–4 mm, the vestiture as on stems; inflorescence ca. 2 cm long, dense, later to 6 cm long, the flowers in loosely disposed verticillasters, lower bracts 1–1.7 cm long, 0.4–1 cm wide, ovate or ovate-lanceolate, 181 gradually tapering to a short or fairly long point, almost scarious, pale green or very often lilac-tinged, glandular, with long-ciliate margins, the nerves slightly prominent; calyx ca. 2 mm long at anthesis, densely hairy and glandular; corolla rather small, 1.5–2 cm long, yellow, densely hairy and glandular outside. June–August.

Chalk outcrops and slopes. — European part: V.-Don (southwestern part) and L. Don (western part). Endemic. Described from the vicinity of former Svyatogorskii monastery and Derkul'skaya steppe. Type and paratypes in Leningrad.

100. **S. chitrovoi** Juz. in Spisok rast. gerb. fl. SSSR, XI (1949) 147. — Exs.: GRF, No. 3472.

Subshrub, with woody flexuous rhizome; stems few, 25–56 cm long, ascending at base, woody in lower part, strongly flexuous, covered in inflorescence with profuse stipitate glands and short (though longer than glands) straight spreading hairs; branches suberect, elongate, flexuous, violet (like stems) and covered over nearly the whole length with fine white reclinate curved hairs; leaves on main stems large, 1.8–3.5 cm long, 0.7–2 cm wide, broadly ovate, 1½–2 times as long as wide, subtruncate or very often subcordate, rarely rounded at base, obtuse or rarely subacute at apex, unevenly dentate, with 6–11 rather high obtuse or rarely acute teeth; upper cauline and ramal leaves narrower, ovate or lanceolate, acutish with fewer shorter acute teeth, distally entire, subglabrous above, densely glandular-punctate beneath, the veins prominent, very finely hairy; lower leaves long-petioled (ca. 1 cm), other leaves with shorter petioles and vestiture like that of branches; inflorescences terminal, at first 3–4 cm long, dense, later elongating to more than 10 cm, with loosely disposed whorls; bracts small, the lower 0.8–1.2 cm long, 5–8 mm wide, all broadly ovate or elliptic, abruptly attenuate to a very short point or subobtuse, almost scarious, pale green or sometimes apically slightly violet, glandular and hairy, with long-ciliate margins, the nerves somewhat prominent; calyx small, 2–2.5 mm long, densely hairy and glandular; corolla rather large (1.5) 1.8–2.5 cm long, densely hairy and glandular outside, yellow, the upper lip and lateral lobes violet. May–June.

Meadows, calcareous taluses and debris. — European part: V.-Don (western part). Endemic. Described from El'tsa (bank of Sosna River). Type in Leningrad.

182 101. **S. cisvolgensis** Juz. in Spisok rast. gerb. fl. SSSR, XI (1945) 149.

Subshrub, with vertical sparingly branching slightly flexuous root; stems few to fairly

numerous, 15–20 cm long, arched-ascending at base, branching only at base, violet, in lower part glabrous, with fine white antrorse hairs above, in inflorescence densely patent-hairy and glandular; leaves medium-sized, 1.5–3 cm long, (0.6) 0.9–1.5 cm wide, oblong-ovate, 2–2½ times as long as wide, usually rounded at base, obtuse at apex or the upper subacute, shallowly crenate-dentate with 3–7 strongly tapering obtuse or acutish teeth on each margin, with scattered hairs above, glandular-punctate beneath, very finely hairy along the veins; petioles to 1.2 cm long, covered with hairs of varying length; upper leaves with petioles 1–2 mm long; inflorescence 2–3 cm long, dense, later slightly elongating; bracts rather short, the lower 1.3–1.5 cm long, 0.8–1 cm wide, broadly ovate, gradually attenuate to a well developed point, almost scarious, pale green, slightly hairy and glandular, with ciliate margin; calyx 3–4 mm long at anthesis, densely hairy and glandular; corolla rather small, to 2 cm long, yellow, hairy and glandular outside. June.

Steppes. — European part: V.-Don (eastern part). Endemic. Described from Lavin-skaya steppe (Ul'yanov Region), between Kanadya and Lavo. Type in Leningrad.

Note. A little known species that is apparently becoming extinct; needs further investigation.

102. *S. oxyphylla* Juz. in Spisok rast. gerb. fl. SSSR, XI (1945) 149. — *S. alpina* β . lupulina Ldb. Fl. Ross. III (1849) 394, p. p.; Shmal'g. Fl. II, 327, p. p.

Subshrub; root and caudex woody, flexuous, tuberculate; stems few or many, 15–40 cm high, ascending at base, usually slightly curved or flexuous, simple or often branching, mostly violet-tinged, covered, except in lower woody part, with rather copious fine white reclinate curved hairs, in inflorescence densely stipitate-glandular and patent-hairy; leaves medium-sized to fairly large, 1.3–4 cm long, 0.5–1.7 cm wide, ovate, $2\frac{1}{3}$ – $2\frac{1}{2}$ times as long as wide, obtusish or rounded or sometimes broadly cuneate at base, subacute or upper leaves acute, attenuate at apex, irregularly serrate-dentate or crenate-serrate with
183 5–8 rather large high obtuse or often acute teeth on each margin, the outer margin of teeth straight or mostly slightly curved, twice as long as their inner margin, distally entire, glabrous or sparsely and finely appressed-hairy above, glandular-punctate beneath, glabrous or very finely hairy on the veins, the petioles to 1.2 cm long (lower leaves); uppermost leaves short-petioled; vesture of petioles on the margins as on stems, elsewhere as on veins on the underside of leaves; inflorescence ca. 3–5 cm long, rather dense, later to 9 cm long, with flowers in loosely disposed verticillasters; lower bracts (1) 1.5–2 cm long, (5) 6–8 mm wide, oval or elongate-ovate, pointed at apex, somewhat scarious, pale green or suffused with lilac, sparsely glandular-hairy or subglabrous, with long-ciliate and stipitate-glandular margin, the veins somewhat prominent; calyx at anthesis ca. 3 mm long, densely hairy and glandular; corolla 2.5–3.5 cm long, plain yellow or often with 3 violet spots (at the tip of upper lip and on lateral lobes), hairy and glandular outside. June–August. (Plate XI, Figure 1.)

Steppes, stony slopes, outcrops, bluffs, pebbles. — European part: Transv., V.-Kama; West Siberia: U. Tob. Endemic. Described from Bashkiria, Mesyagutov canton, near Duvan and Arkhaul. Type and paratypes in Leningrad.

103. *S. supina* L. Sp. pl. (1753) 598, p. p. (excl. pl. e “Tataria” et syn. Tournef.); Kryl. Fl. Zap. Sib. IX, 2302. — *S. lupulina* L. Sp. pl. II (1763) 835. — *S. alpina* β .

lupulina Benth. in DC. Prodr. XII (1848) 412; Ldb. Fl. Ross. III, 394, p. p. — Exs.: E. Smirnov, Pl. alt. exs. No. 69.

Subshrub, with woody oblique or creeping rhizome; stems rather numerous, 10–45 cm long, ascending or sometimes suberect, simple or branching, covered with fine subappressed usually reclinate hairs and longer divergent or horizontally spreading hairs (the latter often very copious, especially in upper part of stem), pale yellowish-green or fairly purple; leaves 1–4 cm long, 0.6–2 cm wide, oblong-ovate or ovate, obtuse, only the upper sometimes subacute, shallowly or rather deeply crenate-dentate with 4–7 teeth on each margin, the upper surface sparsely or rather copiously hairy, the hairs stiff and mostly curved, often thickened at base, the lower surface glandular-punctate and often with same vesture as the upper side or with long or short spreading hairs confined to veins; petioles of lower
184 leaves approximately half the length of blade, with vesture as on stems; upper leaves sessile; inflorescence short, compact, slightly elongating in fruit, 2.5–4 cm long; bracts large, the lower 1.5–2 cm long, 0.5–1.2 cm wide, ovate or rarely oblong-ovate, obtuse to subacute, pale green or lilac-tinged, rather sparsely long-hairy, with intermixed shorter glandular hairs or sometimes subglabrous, the margins long-ciliate; calyx ca. 2 mm long, glandular-hairy; corolla usually large, 2.2–3.5 cm long, yellow, glandular-hairy outside; nutlets ca. 1.5 mm long, triangular-ovoid, covered with short stellate hairs. End of May – August.

Stony mountain slopes or meadows, ascends to the alpine belt. — West Siberia: Irt.? Alt.; East Siberia: Ang.-Say. (Minusinsk district); Centr. Asia: Dzu.-Tarb. **Gen. distr.:** W. Mong. Described from Siberia. Type in London.

Note. When writing about the occurrence of *S. supina* L. in Siberia and “Tataria,” Linnaeus probably had in mind *S. oxyphylla* Juz. as well as the Siberian plant. Fixing the name *S. supina* L. for the Siberian (Altai) plant was proposed by us (cp.: Spisok rast. gerb. fl. SSSR, XI (1945) 149 (?)).

104. **S. altaica** Fisch. ex Sweet Brit. Flow. Gard. (1823–1825) 45; Spreng. Suppl. Syst. veg. (1828) 16; Kryl. Fl. Zap. Sib. IX, 2302. — *S. lupulina* β . *violacea* Bge. in Ldb. Fl. Alt. II (1830) 394. — *S. alpina* Ldb. Fl. Ross. III (1849) 394 (excl. var. β) et auct. plur. non L. — **Ic.:** Sweet, l. c. tab. 45.

Perennial; rhizome rather stout, oblique or creeping, woody; stems few, 10–40 cm long, ascending or suberect, simple or branching, covered with short reclinate hairs and, sometimes only in upper part, long spreading hairs; leaves 1.2–4 cm long, 0.5–2.5 cm wide, ovate or oblong-ovate, rounded or subcordate or sometimes slightly tapering at base, subobtuse to subacute, crenate-dentate with 4–9 obtuse or acute teeth on each margin, sparsely covered on both sides (mainly on veins beneath) with short or fairly long hairs or sometimes subglabrous; petioles of lower leaves approximately 1/3 as long as blade, with vesture like that on stems; upper leaves sessile; inflorescence at first 2.5–4 cm long, to 10 cm after flowering; bracts medium-sized, the lower 14–20 mm long, 5–12 mm wide, ovate, obtuse or acute, scarious or rather firm, usually violet, sparsely long-hairy or sub-
185 glabrous, with ciliate margins; calyx ca. 2 mm long, glandular-hairy; corolla 20–25 mm long, smaller than in *S. supina*, glandular-hairy outside, violet, with paler lower lip. June–August.

Stony mountain slopes or meadows, steppes or sometimes alpine meadows, forests,

pebble-beds. — West Siberia: Ob. (Tomi River valley, Kuznetskii Ala-Tau), Alt.; East Siberia: Ang.-Say. (basin of Abakan River). Endemic. Described from Altai (from Mor-dovkin specimens, probably from Ridder mine). Chirotype (Fischer) in Leningrad.

105. **S. mongolica** Sobolevsk. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 49.

Perennial; rhizome thick, nearly vertical; stems few, 16–25 cm long, erect, green, covered with fine reclinate appressed hairs interspersed with long fine spreading hairs; leaves 1–1.5 cm long, 0.5–1 cm wide, oblong-ovate, cuneately tapering at base, glabrous on both sides, the petioles 0.5–1 cm long, covered with fine white spreading hairs; inflorescence dense; flowers 1–2 in axils of bracts, crowded, on short pubescent pedicels; calyx 2–3 mm long, densely glandular-hairy; corolla large, 2.5–3 cm long, dark blue, pubescent, upper lip slightly shorter than the lower. June.

Sandy terraces and river valleys. — East Siberia: Ang.-Say. (Tuva ASSR). Endemic? Described from Kaakhem River valley near Bel'bya. Type in Tomsk.

Note. We have not seen specimens of this plant and we rely entirely upon the author's description.

106. **S. irregularis** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 369.

Perennial; root vertical, woody; rhizome decumbent, branching or strongly branching; stems several to fairly numerous, 8–16 cm long, ascending, usually simple, covered with short or mostly medium white reclinate or, in upper part, horizontally spreading hairs usually somewhat lilac-tinged; leaves ca. 2 cm long, 1–2 cm wide, ovate or mostly oblong-ovate to narrowly subrhombic, cuneately tapering at base, usually subacute, deeply incised-dentate with 2–4 teeth on each margin, the teeth irregular, tapering, semioval or frequently oblong, obtuse, antrorse or divaricate; both sides sparsely or rather densely short-spreading-hairy; petioles to 1 cm long; inflorescence lax, 3–6 cm long; bracts to 1.2–1.5 cm long, 8–10 mm wide, ovate, acute, rather densely long-villous with admixture of very short stipitate glands, more or less suffused with lilac; corolla rather small, ca. 2–2.5 cm long, yellow, hairy and glandular outside. Otherwise, similar to *S. supina*. June–July.

Meadow and stony slopes in the subalpine meadow zone. — Centr. Asia: Dzu.-Tarb. (Saur Range). Endemic. Described from Upper Chegan-Obo, Taya-Bulak River. Type in Leningrad.

Note. There is no doubt that this species is very closely related to the true *S. supina* L., yet distinctly leaning toward the Tien Shan *S. oligodonta* Juz. which, together with a few other rather closely allied forms, has been segregated as the series *Oligodontae* Juz. (see below).

107. **S. knorringiae** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 366.

Subshrub, with woody creeping caudex; stems few, 10–20 cm long, ascending at base; shoots covered with soft spreading or reclinate hairs, rather densely so in their upper part; internodes medium long; leaves large, 1.5–3.5 cm long, 1.2–2.5 cm wide, broadly ovate, cordate at base, obtuse at apex, crenate-dentate with 6–10 subequal obtuse teeth ca. 1.5 mm high on each margin, green on both sides, covered with numerous small stipitate glands and long simple hairs, these more numerous on the margin and on veins beneath,

very few elsewhere; petioles short; inflorescence in flower 2.5–4.5 cm long; bracts loosely imbricated, ca. 1.3 cm long, 0.7 cm wide, broadly elliptic or ovate, entire or the lower generally with few teeth, green or slightly suffused with lilac, rather densely glandular and hairy; calyx at anthesis small, ca. 2.5 mm long, densely stipitate-glandular and much less profusely long-hairy; corolla large, to 3 cm long, copiously glandular outside, yellow or upper lip slightly violet-tinged. July.

Mountain slopes and ravines. — Centr. Asia: T. Sh. (western part). Endemic. Described from Chotkal Range, ravine near Aflatun River, and from Kul'dambes Mountains near Sary-Chilek Lake. Type and paratype in Leningrad.

108. *S. xanthosiphon* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 367.

Subshrub; rhizome and roots woody; stems few (2–5), 15–25 cm long, suberect from somewhat ascending base, woody in lower part, slightly curved or flexuous, simple, pale
187 green, covered all over with numerous short as well as scattered long spreading hairs; leaves rather large, 1–3 cm long, 0.5–2 cm wide, ovate, approximately twice as long as wide, slightly tapering or broadly cuneate at base, obtuse at apex, green on both sides although covered with scattered (more numerous beneath) fine hairs; margins rather shallowly and unevenly dentate with 6–9 teeth on each margin, the lower teeth sometimes acute, others obtuse, inequilateral, with outer margin twice the length of the inner, obtuse, mostly round-tipped; veins prominent beneath, rather densely covered with fine hairs; lower leaves with rather long petioles (to 1.5 cm), others short-petioled; vesture of petioles like that of stems, but the hairs longer and often more profuse; inflorescence 3.5–6 cm long, loose; bracts 1.5–2 cm long, 0.6–1.3 cm wide, ovate or elliptic, acute but scarcely acuminate, foliaceous, green, covered, more densely on the margin, with long simple soft hairs, the nerves rather prominent; calyx at anthesis ca. 3 mm long, rather densely hairy; corolla large, ca. 3 cm long, very finely hairy and glandular outside, bicolored, the tube bright yellow, the lips purple; lower lip medium-sized. June.

Subalpine meadows. — Centr. Asia: T. Sh. Endemic. Described from Dzhelalabad region, Kugartskii sovkhov, on the road to Urumbash. Type in Leningrad.

Series 5. *Oligodontae* Juz. — Like the preceding series, but leaves with fewer (usually not more than 5), less developed, often flattened or obsolescent teeth. High-mountain forms, usually smaller than members of series *Supinae* Juz.

109. *S. oligodonta* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 370. — *S. alpina* var. *prostrata* Trautv. Enum. pl. Songar, a Schrenk collect. (1866) 134. — *S. alpina* var. *minor* Rupr. in Osten-Sacken et Rupr. Sert. tiansch. in Mém. Ac. Sc. Pétersb. VII sér. t. XIV, No. 4 (1869) 66. — *S. alpina* var. *elegans* Meinsh. in sched. — *S. alpina* var. *bedelensis* Krassn. in sched. (nomen) and in Spisok rast., sobr. v vost. Tyan'-Shane letom 1886 g. (1887) 94 (diagn. sine nomine varietatis!).

Subshrub, with vertical root and stoutish or rather slender, branching, procumbent woody rhizome; stems numerous, slender or sometimes fairly stout, ascending or some-
188 times suberect, flexuous, curved, simple or sometimes strongly branching, 6–20 cm long; leafy shoots with long (especially in upper part) or short spreading hairs intermixed with

stipitate glands, often lilac-tinged (especially in lower part), the internodes short or long; leaves small or medium, 0.4–2.4 cm long, 0.2–1.4 cm wide, ovate, widest below middle, rounded or, in upper leaves, angled at base, apically obtuse, rather deeply crenate-dentate with 1–5 teeth to 3 mm high on each margin, occasionally some leaves entire, green on both sides, sparsely or (especially beneath) rather densely covered with hairs and stipitate glands of varying size; petioles with short spreading hairs, 1.5–6 mm long; inflorescence 3–5.5 cm long, dense; bracts ovate-elliptic or broadly ovate, the lower bracts 1–1.5 cm long, 0.5–1.2 cm wide, subobtuse to subacute, entire or the lower few-toothed, subherbaceous, rather densely covered all over with long spreading hairs and stipitate glands, green or often deeply lilac; calyx at anthesis 2–3 mm long, hairy and copiously glandular; corolla medium to fairly large, 2.5–3.5 cm long, densely hairy and stipitate-glandular outside, yellow, the upper lip and its lobes violet, the lower lip with violet markings. June–July. (Plate XI, Figure 2.)

Meadow slopes, alpine meadows, placers. — Centr. Asia: Dzu.-Tarb. (Dzungaria Ala-Tau), T. Sh. **Gen. distr.:** Dzu.-Kash. Described from Aulie-Sai ravine (Dzungaria Ala-Tau). Type in Leningrad.

110. **S. paulsenii** Briq. in Bot. Tidskr. 28 (1908) 233. — *S. alpina* var. *prostrata* f. *pamirica* O. Fedtsch. Flora Pamira (1903) 171. — *S. filicaulis* auct. plur. non Rgl. — Ic. (phot.): Briq. l. c. 234 (fig. 1).

Subshrub, with woody rather slender rhizome; stems numerous, mostly rather slender, procumbent or ascending, flexuous, not or slightly branching, 6–15 cm long; shoots with very short appressed or somewhat spreading hairs or subglabrous, the internodes short or sometimes elongate; leaves small, 0.6–1.4 cm long, 0.4–0.9 cm wide, ovate, widest below middle, rounded-cuneate at base, obtuse or rounded at apex, very shallowly crenate with 1–4 teeth ca. 0.5 mm high on each side (some leaves nearly entire at times), green on both sides, diffusely puberulent, sometimes only on the veins beneath and on margins, or glabrate all over, finely granular-glandular beneath; petioles short (1–2.5 mm) or leaves subsessile; inflorescences to 5 cm long, rather dense; bracts to 1.2 cm long, 1 cm wide, elliptic, subherbaceous, entire or with isolated teeth, loosely long-villous along the margin, with scattered long hairs elsewhere, mostly turning deep lilac, occasionally pale green; calyx at anthesis small, to 2–3 mm long, loosely short-villous; corolla rather large, ca. 2.5 cm long, with short hairs and short stipitate glands outside, bicolored, pale yellow, the tip and lateral lobes of upper lip violet; nutlets unknown. June–August.

Alpine meadows, mountain slopes, rocks, banks and dry beds of mountain streams, at altitudes of 3500–3700 m. Centr. Asia: Pam.-Al. (Alai valley, Pamir). Endemic. Described from Bordo-Aba and Kara-Su River. Type in Copenhagen, paratype in Leningrad.

Note. As far as known, this plant was collected for the first time in 1878 by Kushakevich, Skornyakov and Ashurbaev.

111. **S. filicaulis** Rgl. in Opis. nov. vid. v putesh. v Turkest. A. P. Fedchenko, 18, III (1882) 69.

Perennial; caudex (or rhizome) rather slender, procumbent, flexuous, nodose, gray, branching; stems numerous, slender, subfiliform, procumbent, branching, 4–10 cm long, with very short spreading hairs (bloomlike pubescence visible only with a magnifying glass),

often lilac-tinged; leaves 0.3–1.4 cm long, 0.2–1 cm wide, short-elliptic, ovate or obovate, rounded or slightly tapering at base, obtuse, entire or with few (1–3) shallow and asymmetrical crenations on each margin, green on both sides or suffused with lilac beneath, diffusely covered all over above, mainly along veins and margins beneath, with very fine short scarcely discernible hairs or subglabrous, the undersurface finely granular-glandular; petioles 1–10 mm long, slender, very sparingly pubescent; inflorescence 2.5–3.5 cm long, few-flowered (mostly 4–6 flowers); bracts 0.4–1 cm long, 2–5.5 mm wide, subherbaceous, elliptic, acute, entire, diffusely puberulent and with fine short stipitate glands, often lilac-tinged; calyx ca. 2 mm long, rather densely pubescent; corolla ca. 2.5 cm (sometimes to 3 cm) long, short-hairy and glandular outside, with rather slender yellowish tube, the upper lip violet-blue, the lower lip with a spot or markings of same color; nutlets ca. 1 mm long, short-hairy. July–August. (Plate XI, Figure 3.)

190 Dry beds of streams and taluses in the alpine mountain belt, near glaciers and snow at 2500–3100 m. — Centr. Asia: Pam.-Al. (western tip of Alai Range, Turkestan Range). Endemic. Described from Kavuk. Type in Tashkent, isotype in Leningrad.

112. **S. kugarti** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 371.

Perennial; rhizome slender; stems numerous, procumbent, strongly flexuous, 6–12 cm long; leafy shoots softly patent-hairy and glandular, pale green or scarcely colored; leaves 0.4–2.2 cm long, 0.2–1 cm wide, ovate or obovate, tapering at base, obtuse to subacute, deeply incised-crenate or crenate-dentate with 1–3 teeth on each margin (in upper leaves these to 5 mm high), grayish-green on both sides, densely hairy and glandular, short-petioled; inflorescence 3–4 cm long; bracts to 1.5 cm long, 0.8 cm wide, green, herbaceous, scarcely differing from cauline leaves in consistency, shape, dentation and vesture; calyx 3 mm long, rather sparsely hairy and glandular; corolla ca. 2.5 cm long, hairy and glandular outside, purple-lilac, the relatively slender tube pale. July–August.

Mountain slopes in the alpine zone. — Centr. Asia: T. Sh. (Fergana Pass). Endemic. Described from the Kugart region. Type in Leningrad.

113. **S. popovii** Vved. sp. nov. in Addenda XIX, 347. — *S. physocalyx* M. Pop. in Sched. ad Herb. As. Med. Fasc. IX (1926) No. 202, nec aliorum. — Exs.: HFAM, No. 202.

193 Perennial; flowering stems 5–8 cm long, in habit recalling most of all *S. filicaulis* Rgl., but in vesture of stems, leaves and bracts, and in color of corolla similar to *S. oligodonta* Juz.; distinguishable from the latter by smaller, suborbicular to rounded-reniform leaves approximately as long as or even shorter than wide (3–9 mm by 3.5–11 mm), subcordate at base, the teeth more numerous (to 6 on each margin), smaller, rounded, both surfaces grayish-green, densely covered with stiffish simple hairs and rather long-stipitate glands; petioles 2–10 mm long; inflorescence 2.5–3.5 cm long, dense; bracts large, to 1.3 cm long, 1 cm wide, broadly elliptic or oblong, attenuate at both ends, obtuse or mostly subacute at apex, densely covered with long hairs and long-stipitate glands, dark violet; corolla 2–2.5 cm long, with large lips and broad tube, yellow, with purple-tipped upper lip and purple markings on lower lip. August.

Loose stony placers in the alpine mountain belt. — Centr. Asia: T. Sh. (Kirghiz Ala-Tau). Endemic. Described from Dzhaman-Ichke Mountain (Ak-Su River). Type in Tashkent, isotype in Leningrad and other places.

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PLATE XI. 1 – *Scutellaria oxyphylla* Juz., general aspect, fruiting calyx, its upper and lower parts, nutlet; 2 – *S. oligodonta* Juz., general aspect; 3 – *S. filicaulis* Rgl., general aspect; 4 – *S. ocellata* Juz., flower; 5 – *S. karatavica* Juz., summit of stem, flower; 6 – *S. cordifrons* Juz., general aspect.

Note. This plant was accepted in error by Popov as *S. physocalyx* and even distributed as such with the inclusion of mature calyces of that species taken from Alai specimens. There is no need to demonstrate that the similarity between *S. popovii* and *S. physocalyx* is purely superficial. In our view, *S. popovii* is closely allied to *S. oligodonta* Juz., being apparently an intermediate form between the latter and *S. talassica* Juz.

114. *S. talassica* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 392.

Perennial; rhizome slender, branching; stems ca. 4 cm long, slender, flexuous, gray, with short spreading crisp hairs, the nodes approximate; leaves small, 3–7 mm long, 2–6 mm wide, ovate-rhombic, rectangular at base, incised-crenate-dentate with 2–4 obtuse semielliptic teeth on each margin, grayish-green or whitish-green on both sides, with short imperfect tomentum, the veins impressed above, prominent beneath; petioles 3–6 mm long, rather densely pubescent; inflorescence terminal, short, loose; flowers few; bracts 6–8 mm long, broadly lanceolate, acute to subobtuse, few-toothed or the upper almost entire, densely covered with long spreading hairs interspersed with stipitate glands, pale violet in upper part; pedicels ca. 1 mm long; calyx 2–3 mm long, densely covered (like pedicels) with almost straight spreading hairs of medium length; corolla disproportionately large (for the size of the plant and its leaves), 2.2–2.5 cm long, 6 mm wide at throat, with lips 6–7 mm long, apparently pink, the lower lip with a yellow spot. August.

Mountain slopes and ravines. — Centr. Asia: T. Sh. (Talass Ala-Tau). Endemic. Described from Sarym-Sak ravine. Type in Leningrad.

Note. A most distinctive, possibly hybrid form which, in some features, approaches certain *Pulchellae* Juz. of the preceding subsection.

Series 6. *Subcordatae* Juz. — Subshrubs or perennial herbs, resembling species of 194 the two preceding series (recalling *Oligodontae* in size and *Supinae* in leaf dentation), but vesture well developed on both leaf surfaces, consisting of somewhat crisp hairs but not forming a real tomentum; leaves with more or less distinctly cordate base, the strongly developed lower lateral veins flabellately spreading from near the base.

115. *S. linczevskii* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 373. — *S. cordifolia* var. *tomentosa* Lincz. in sched.

Subshrub 8–15 cm high; root vertical, woody, caudex procumbent, strongly branching, flexuous, gray-brown, woody, radicant; leafy shoots numerous, densely disposed, short, straight or curved, not colored or faintly suffused with lilac, very densely and continuously villous, the hairs soft, horizontally spreading, slightly crisp, of medium length (stipitate glands, as also on leaves and petioles, wanting or very few); leaves 0.5–1.5 cm long, 0.3–1 cm wide, ovate or broadly ovate, with cordate (especially in lower leaves) or truncate base, obtuse or rounded at apex, evenly finely and shallowly crenate with 4–8 rounded teeth on each margin, green or grayish-green on both sides, densely covered with spreading, slightly crisp or nearly erect hairs of medium length, veins flabellately spreading, usually impressed above, prominent beneath and densely patent-hairy; petioles patent-villous, 1–8 mm long, or upper leaves sessile; inflorescence 2–3.5 cm long, rather dense; bracts to 1–1.5 cm long, 5–9 mm wide, ovate-elliptic, tapering at base, acuminate at apex,

almost flat, with rather prominent longitudinal nerves, suffused with violet, rather densely covered with long spreading hairs interspersed with long-stipitate glands; calyx at anthesis ca. 3 mm long, villous; corolla rather small, 1.5–2.5 cm long, with broad tube, rather densely hairy and glandular outside, yellow, the lower lip and the tip and lateral lobes of upper lip sometimes colored; nutlets so far unknown. June–August.

Stony slopes in subalpine zone, alpine grassy areas. — Centr. Asia: T. Sh. (western part, Talass Ala-Tau in particular). Endemic. Described from upper reaches of Kshi-Kaında River. Type in Leningrad.

116. **S. subcordata** Juz. sp. nov. in Addenda XIX, 348.

- 195 Subshrub 8–20 cm high, similar in habit to *S. linczevskii* Juz.; leafy shoots less densely covered with relatively short curved or crisp hairs, sometimes almost tomentose, usually not anthocyanin-colored; leaves 1–2.5 cm long, 0.4–2.2 (2.6) cm wide, ovate to suborbicular, at least the lower subcordate, others mostly obtuse or broadly cuneate at base, obtuse or rounded at apex, sometimes acute, coarsely crenate-dentate with 5–8 unequal obtuse or rounded teeth or crenations on each margin, both sides green, with scattered short hairs, these crisp beneath, straighter and almost accumbent above; lower lateral veins mostly arcuately divergent from base, moderately impressed above and prominent beneath; petioles 1.5–12 mm long, softly crisp-hairy; inflorescence 3–4.5 cm long, loose; bracts 1–1.5 cm long, 0.4–0.8 cm wide, ovate, obtuse, almost flat, with inconspicuous longitudinal nerves, rather sparsely covered with long spreading hairs interspersed with stipitate glands, green, subherbaceous; calyx at anthesis ca. 2.5 mm long, with long soft hairs; corolla 2.2–2.7 cm long, rather sparingly long-stipitate-glandular outside, with rather narrow tube, yellow with dark spot on lower lip. July.

Rocks and gravelly places in subalpine and alpine mountain belts. — Centr. Asia: T. Sh. (western part, Kirghiz Ala-Tau at its western tip). Endemic. Described from Taldy-Bulak (opposite Akyr-Tyube). Type in Tashkent.

Series 7. *Subcaespitosae* Juz. — Like the preceding series, but leaves broadly cuneate at base; lower lateral veins weakly developed, hence venation essentially pinnate.

117. **S. subcaespitosa** Pavl. in Tr. Sredneaz. Gos. univ. ser. VIII-C (botany), 19 (1935) 33.

- Perennial; caudices numerous, congested, procumbent, flexuous, caespitose, persistent, woody radicans; anthesis stems ascending, rarely erect, low, 5–8 cm long, rather densely patent-hairy, remotely glandular above; leaves 11–20 mm long, 10–15 mm wide, ovate, broadly cuneate at base, obtuse at apex, crenate-dentate with 5–7 large obtuse teeth on each margin, covered on both sides, especially on the veins beneath, with short spreading hairs; petioles patent-hairy, as long as or slightly shorter than blade; inflorescence 2–5 cm long, rather dense, 3–10-flowered; bracts oblong-ovate, scarious, finally almost flat, entire or with few teeth, sparsely short-stipitate-glandular and long-hairy, pale green or often slightly lilac-tinged; calyx small, short-glandular, sparsely hairy; scutellum large, rounded, glabrous, netted-veined; corolla large, 2–3 cm long with long narrow tube, yellow, the lower lip deeply colored and usually shorter than the upper; nutlets ca. 1 mm long, cinereous, with short stellate hairs. June.
- 196

Stony slopes. — Centr. Asia: T. Sh. (eastern part of Kara-Tau mountain system). Endemic. Described from Mashat-Tau mountains near Tyul'kubass railway station. Type in Moscow.

Economic importance. A dye (water extract dyes fabric pale lemon yellow).

118. *S. lanipes* Juz. sp. nov. in Addenda XIX, 349.

Perennial; very similar to *S. subcaespitosa* Pavl.; differing in growth habit and vesture; caudex ramifications rather few, elongate, hence plant not caespitose; annotinous shoots (stems) suberect, ca. 10 cm long, very densely long-patent-hairy, almost villous; leaves ovate or broad-ovate, with obtuse or slightly cordate base, grayish-green on both sides with very profuse slightly crisp hairs, beneath almost (imperfectly) tomentose; petioles and young leaves densely long-villous-lanate-hairy; bracts commonly to 1 cm long, ovate-elliptic or rather broadly ovate, acute, almost villous; corolla unknown. Otherwise, like *S. subcaespitosa* Pavl. June.

Mountain slopes, stony substratum. — Centr. Asia: T. Sh. (western part: Ichkele-Tau mountains). Endemic. Described from Ichkele-Tau mountains. Type in Tashkent.

Note. A little known species, described from insufficient and unsatisfactory material.

119. *S. toguztoraviensis* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 375.

Perennial; rhizome woody, rather stout, pale brown, nodose, branching; leafy stems 7–13 cm long, few, ascending or suberect, densely covered with long horizontally spreading hairs, not colored; leaves 0.6–1.7 cm long, 0.5–1.2 cm wide, usually longer than internodes, 197 ovate, with obtusely angled base, obtuse at apex, the margin with 4–7 angled teeth of medium height, the upper surface darkish green or grayish-green, densely covered with long appressed hairs, the lower surface grayish-green, rather densely patent-hairy, the hairs shorter, partly slightly crisp, partly straight; petioles densely long-patent-hairy, to 1 cm long; inflorescence 3–4.5 cm long (in full flower), rather dense; bracts to 1.7 cm long, 1 cm wide, elliptic, short-attenuate at both ends, obtuse at apex, almost flat, rather densely covered with simple longish spreading hairs and numerous short-stipitate glands, slightly lilac-tinged; calyx small, long-hairy and densely stipitate-glandular; corolla large, 2.5–3 cm long, bright yellow, copiously covered outside with short-stipitate glands, the broad tube slightly curved, the lower lip large, often exceeding the upper, the tip and lateral lobes of upper lip sometimes purple; nutlets unknown. June.

Mountain slopes. — Centr. Asia: T. Sh. (central). Endemic. Described from natural boundary Toguz-Torau, near Oikain mountain pass. Type in Leningrad.

120. *S. alexeenkoi* Juz. sp. nov. in Addenda XIX, 349.

Subshrub, with rather sturdy, strongly branching caudex; stems numerous, stout, ascending and arcuately or even geniculately curved, mostly simple, 8–20 cm long; shoots densely covered with horizontally spreading short and long hairs, the latter very copious, soft and slightly flexuous; internodes short or medium, leaves rather large, to 4 cm long, to 2.5 cm wide, ovate or broadly ovate, with truncate or sometimes subcordate base, obtuse at apex, shallowly and finely crenate-dentate with 5–8 teeth on each margin, green on both sides, more or less densely short-hairy; petioles 0.5–1.2 cm long; inflorescence ca. 4–5, sometimes to 8 cm long, rather dense; bracts to 1.8 cm long, to 1 cm wide, oblong-ovate, persistent, subherbaceous, entire or with solitary teeth, rather densely covered with

long and short spreading hairs intermixed with stipitate glands, pale green; calyx at anthesis small, to 3 mm long, villous-hairy and glandular, in fruit to 1 cm long including the subglabrous scutellum; corolla large, ca. 3 cm long, short-hairy and short-stipitate-glandular outside, with rather slender tube, essentially yellow, the tip and lateral lobes of upper lip 198 purple, the lower lip with violet marking (often two spots); nutlets angled-ovoid, ca. 1.5 mm long, bluish, densely covered all over with stellate hairs. June.

Grassy mountain slopes. — Centr. Asia: Pam.-Al. (foothills of Alai Range). Endemic. Described from Lyangar along Taldyk River and from Shakhimardan. Type in Leningrad, paratype in Tashkent.

Note. The type of this species is bereft of flowers and hence their description is based on a much better specimen from Shakhimardan. In our interpretation, *S. alexeenkoi* links *S. xanthosiphon* Juz., the primary species of the entire series *Subcaespitosae*, with *S. ocellata* Juz., and for this reason we have included it in this series. The vesture of its leaves, however, differs slightly as compared with other species of the series.

121. *S. ocellata* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 376.

Subshrub, 12–25 cm high, with woody branching long-creeping caudex; stems numerous, flexuous, ascending at base and rather densely covered, like petioles, with long soft crisp spreading hairs, the internodes often elongate; leaves medium to fairly large, 12–25 mm long, 7–17 mm wide, ovate, mostly truncate at base, coarsely and irregularly crenate-dentate with 4–6 large and rather high straight obtuse teeth (to 4 mm long) on each margin, green on both sides, densely covered (especially on the veins beneath) with long simple crisp hairs; petioles 6–18 mm long; inflorescence 5–6 cm long, usually loose; bracts ovate to broad-ovate, the lower ca. 15 mm long, 7 mm wide, all entire or the lower toothed, flat, subacute to subobtuse, rather densely covered with long hairs interspersed with few short stipitate glands, green or mostly suffused with purple, loosely imbricate; calyx at anthesis medium-sized, ca. 3 mm long, densely hairy, corolla large, to 3.3 cm long, remotely glandular outside, yellow, the upper lip purple-tipped, the lower brownish with 2 large round dark brown spots. May. (Plate XI, Figure 4.)

Habitat unknown. — Centr. Asia: Pam.-Al. (Zeravshan). Endemic. Described from Naufin-Kul' Lake. Type in Leningrad.

Series 8. *Karatavicae* Juz. — In the shape and venation of the leaves, the plant recalls species of the series *Subcordatae*, but is much more xerophytic; leaves subcoriaceous but very brittle when dry; bracts closely contiguous.

122. *S. karatavica* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 372.

199 Perennial, with long slender flexuous branching rhizome; stems procumbent, ascending, slightly flexuous or curved, 10–30 cm long, branching from base, densely short-villous, scarcely colored or more or less lilac-tinged; leaves 0.8–2 cm long, 0.6–2 cm wide, stiff, very broadly ovate or suborbicular, subcordate or rounded at base, obtuse at apex, with 2–6 large rounded crenations on each margin, grayish-green on both sides, densely covered with short spreading velutinous hairs, midrib and lateral veins impressed above, prominent beneath; petioles thickish, to 7 mm long; inflorescence 2.5–3.5 cm long, very dense;

bracts to 1.5 cm long, 1 cm wide, broadly ovate, tapering at base, long-acuminate at apex, subherbaceous, firm, distally lilac-tinged, densely covered, especially along margins, with long simple white hairs, the parallel nerves very prominent; corolla ca. 1.5 cm long, yellow, sparsely hairy outside, with short tube, short hood and large lower lip; nutlets unknown. June. (Plate XI, Figure 5.)

Mountain slopes. — Centr. Asia: T. Sh. (Kara Tau Range). Endemic. Described from Berk-Kara ravine. Type in Leningrad.

Note. This interesting species differs so strikingly from all the other species of the subsection that we were able to segregate it as a series. Apparently it is phylogenetically closely allied to species of the series Subcordatae Juz.

Subgenus 2. **Cystaspis** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1952) 413 (pro sect.). — Perennials, recalling in habit some species of the section *Lupularia* A. Hamilt. of the preceding subgenus (especially those of the subsection *Alpinae* and the affined *S. oligodonta* Juz. and others). They differ notably in that the scutellum on the upper (caducous) part of the calyx is replaced by a vesicular-sacciform, membranous appendage that expands markedly in fruit. This appendage encloses the nutlets and undoubtedly aids in their dispersal (apparently by wind and perhaps also by water of streams).

A Central Asian group.

Note. Only two species, *S. physocalyx* Rgl. et Schmalh. and *S. jodudiana* B. Fedtsch., were distinguished within this group prior to our investigation. However, the attempts by different authorities (and collectors) to account for all the Central Asian material of the *Cystaspis* group were unsuccessful since it was virtually impossible to assign some of these forms to one or the other species. We have attempted a more thorough sub-
200 division of the group, stressing in greater detail the characteristics distinguishing these species. But the material at our disposal has been insufficient, and the whole group is in need of further study.

All the species of the subgenus *Cystaspis* so far known apparently form a single series which can be named *Physocalyces* Juz. (its characteristics concur with those of the subgenus).

- | | | |
|----|---|-------------------------------------|
| 1. | Stems and leaves densely villous with long hairs | 127. S. polytricha Juz. |
| + | Vesture different | 2. |
| 2. | Corolla rather large, usually 1.8–2.5 cm long, its predominant color yellow or whitish; appendage of upper calyx lip rather large, to 11 mm in diameter | 3. |
| + | Corolla usually smaller, 2–1.5 (2) cm long, its predominant color lilac; appendage of upper calyx lip usually not more than 8 mm in diameter | 6. |
| 3. | Nearly all bracts with few large marginal teeth; flowers rather small (to 1.8 cm long) | 130. S. schachristanica Juz. |
| + | Bracts usually entire, only the lowermost sometimes toothed at base; flowers larger | 4. |
| 4. | Plants with vertical root and decumbent stems 10–45 cm high; inflorescence rather large, 2.5–6 cm long. | 5. |

- + Plants with long slender branching rhizome and stems 3.5–10 cm high; inflorescence ca. 2 cm long 125. **S. pamirica** Juz.
- 5. Leaves broadly ovate to suborbicular, with truncate or subcordate base; corolla yellow, with violet upper lip 123. **S. physocalyx** Rgl. et Schmalh.
- + Leaves generally ovate to broad-ovate, tapering at base; corolla whitish, the tip and lateral lobes of upper lip purple 124. **S. anitae** Juz.
- 6. Bracts rather narrow, ovate or narrowly rhombic, usually sparsely short-hairy, only at margins densely long-ciliate; corolla relatively large, 1.5–2 cm long. 126. **S. microphysa** Juz.
- + Bracts broad-ovate or elliptic, villous all over with long spreading hairs; corolla small, 1.2–1.5 mm long 7.
- 7. Leaves with usually 3 teeth on each margin; corolla violet-purple, with pale tube 128. **S. jodudiana** B. Fedtsch.
- 201 + Leaves with usually 5 (often to 8) teeth on each margin; upper lip of corolla and its appendages very dark purple, lower lip with a yellow spot at base, the tube yellow. 129. **S. darvasica** Juz.

123. **S. physocalyx** Rgl. et Schmalh. in E. Regel', Opis. nov. vid v putesh. v Turkest. A.P. Fedchenko, 18, III (1882) 68. — Exs.: HFAM, No. 202 (solum calyces fructiferi, neque ipsa planta!).

Perennial; root woody, erect, branching; stems decumbent, flexuous, 10–45 cm long, woody in lower part, sparsely covered with short spreading hairs, more or less suffused with lilac; leaves 0.6–1.7 cm long, 0.5–1.5 cm wide, broadly ovate, triangular or sometimes suborbicular, widest at truncate or sometimes subcordate base, obtuse or acute at apex, incised-crenate or sometimes nearly crenate-lobate, with 2–6 large irregular obtuse crenae on each margin, grayish-lanate on both sides with rather short hairs, these fewer, appressed above, more copious and divergent beneath, on the veins patent; upper surface rugose, with impressed veins, the lower with somewhat prominent veins; petioles 2.5–10 mm long, with short spreading hairs; inflorescence 2.5–6 cm long, dense, subcapitate; bracts 0.8–1.5 cm long, 0.5–1.2 cm wide, much longer than calyx, broadly ovate, elliptic or the upper oblong-elliptic, short- or long-acuminate at apex, the lower crenate at base, the upper entire, green or usually lilac, densely covered on the back with simple crisp hairs of medium length, the margin densely patent-hairy; calyx at anthesis ca. 3 mm long, densely villous with long white hairs, its upper part inflated into an ovoid-globular calceiform sac, in fruit ca. 1 cm in diameter, much larger than the lower part, turning lilac; corolla 2–2.5 cm long, broad at throat, half as long again as bracts, apparently yellow, with violet helmet, hairy and sparsely short-stipitate-glandular; nutlets ca. 2 mm long, ovoid, dark brown or nearly black, sparsely or remotely stellate-hairy. July–August.

Gravelly slopes, pebbles (ca. 2480 m altitude). — Centr. Asia: Pam.-Al. (Alai Range and Alai valley). Endemic. Described from Alai Range (from O. Fedchenko collections). Type in Tashkent, isotype in Leningrad.

124. **S. anitae** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 413.

202 Perennial, stems 6–25 cm long, very strongly flexuous, sparingly pubescent, turning

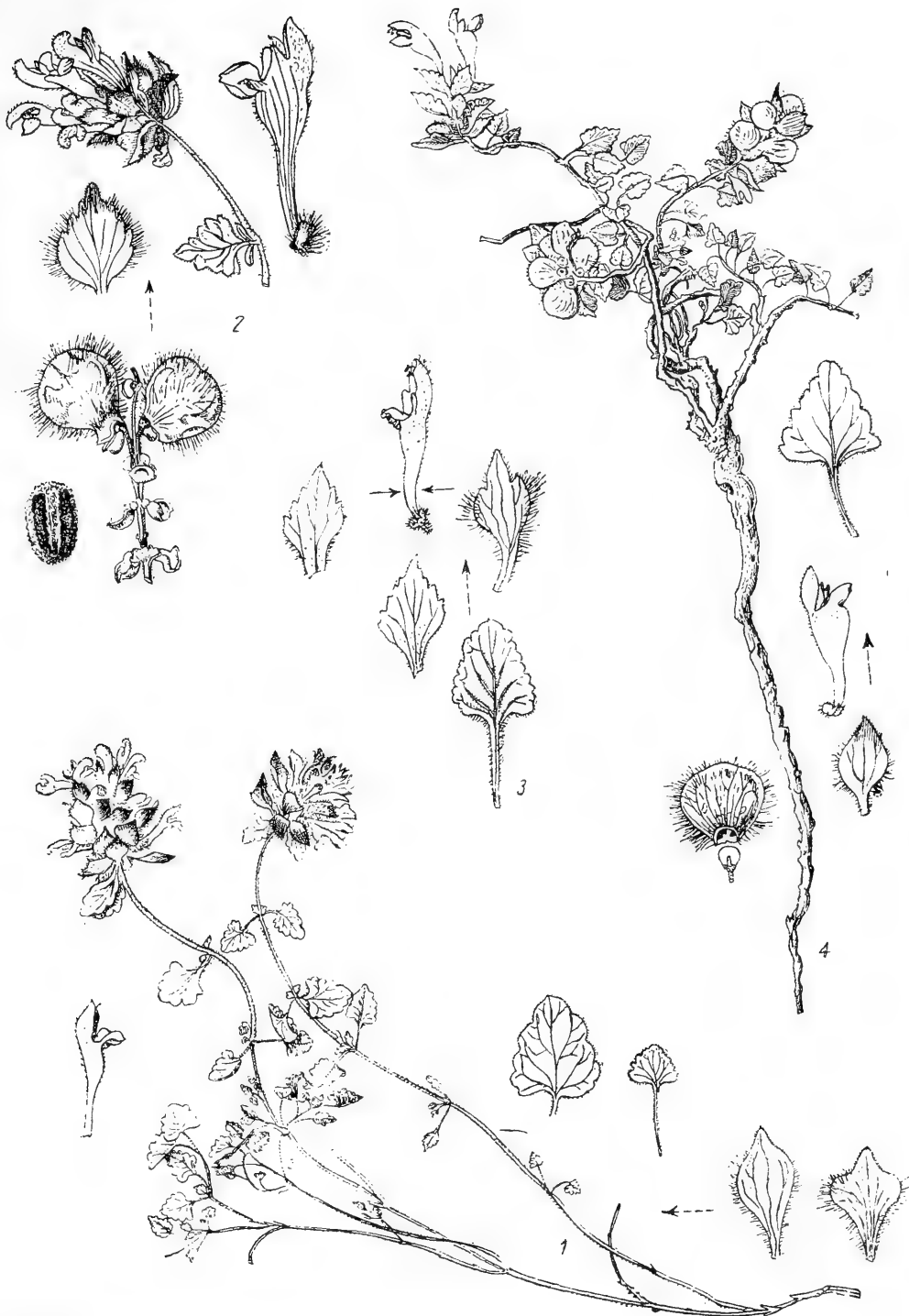


PLATE XII. 1 – *Scutellaria jodudiana* Fedtsch., general aspect, leaves, bracts, corolla; 2 – *S. anitae* Juz., summit of stem, lower bract, flowers, fruiting calyx, nutlet; 3 – *S. schachristanica* Juz., cauline leaf, bracts, flower; 4 – *S. pamirica* Juz., general aspect, cauline leaf, bracts, flower, fruiting calyx.

lilac; leaves 4–10 mm long, 2.5–7 mm wide, ovate or broad-ovate, with 1–4 shallow crenae on each margin; petioles to 7 mm long; inflorescence 2–4 cm long; bracts to 1 cm long, 3–6 mm wide, oblong-ovate, tapering at base, gradually long-acuminate at apex, densely covered all over with simple long straight spreading hairs, usually lilac; sacciform appendage on upper part of calyx 6–11 mm in diameter, pale green or slightly lilac-tinged, patent-hairy; corolla 2–2.3 cm long, white, partially purple-nerved, the tip and lateral lobes of upper lip purple, the lower lip (sometimes also purple) with a yellow rim or spot; nutlets ca. 2 mm long, blackish, densely white-punctate with stellate hairs. Other characters as in *S. physocalyx* Rgl. et Schmalh. August. (Plate XII, Figure 2.)

Gravelly deluvial slopes, stony placers in alpine mountain belt. — Centr. Asia: Pam.-Al. (Gissar Range). Endemic. Described from southern slope of Gissar Range, basin of Sarai-Mion River, upper reaches of Kafandar River. Type in Leningrad.

125. *S. pamirica* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 417.

Perennial, with slender woody root; rhizome long, slender, branching, flexuous; stems low, slender, leafy, 3.5–10 cm long, with short internodes, densely covered with short spreading white hairs, more or less suffused with lilac; leaves in few pairs, 2.5–8 mm long, 2–6.5 mm wide, ovate, with truncate or obtusely angled base, subobtuse, with 2–4 small superficial crenae on each margin, grayish on both sides, with dense imperfect tomentum; petioles densely short-hairy, to 7 mm long; inflorescence ca. 2 cm long; lower bracts ca. 1 cm long, 7 mm wide, ovate-rhombic, tapering at both ends, subacute, densely short-hairy, with long-white-ciliate margins, turning lilac; calyx rather sparingly pubescent, the appendage of its upper part ca. 7 mm in diameter in fruit, slightly lilac; corolla large for
205 size of plant, ca. 2 cm long, apparently yellow with lilac tip and lobes of upper lip, strongly pubescent outside; nutlets ca. 1.5 mm in diameter, blackish, sparsely covered with white stellate hairs. July–August. (Plate XII, Figure 4.)

Stony placers. — Centr. Asia: Pam.-Al. (Shugnan, W. Pamir). Endemic. Described from Yamg district and elevations on Ak-Tailakh. Type and paratype in Leningrad.

126. *S. microphysa* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 414. — Ic.: Yuz., op. cit. 415, Figure 4.

Perennial; stems 7–30 cm long, slightly flexuous or subgeniculately curved, sparsely or densely pubescent, greenish or frequently lilac; leaves 2.5–10 mm long, 1.5–10 mm wide, broadly ovate to rhombic, shallowly or even superficially crenate with 2–6 crenae on each margin, grayish on both sides, with contiguous tomentum; petioles to 5 mm long; inflorescence 2.5–4.5 cm long; bracts small, 7–10 mm long, 3–6 mm wide, ovate to narrowly rhombic, tapering at base, gradually acuminate at apex, densely or usually sparsely short-crisp-hairy, with densely long-white-ciliate margins, usually dark lilac; sacciform appendage on upper part of calyx rather small, 6–8 mm in diameter, lilac, densely patent-hairy; corolla smallish, 1.5–2 cm long, ca. 6–7 mm in diameter at throat, dark purple, with white tube; nutlets ca. 1.5 mm long, very finely and sparsely stellate-hairy. Otherwise resembling *S. physocalyx* Rgl. et Schmalh. and *S. anitae* Juz. July–August.

Stony taluses in alpine zone. — Centr. Asia: Pam.-Al. (Zeravshan valley). Endemic. Described from Langlif. Type in Leningrad.

127. **S. polytricha** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 416.

Perennial, with woody root; rhizome long, procumbent, strongly branching, flexuous; leafy stems 6–18 cm long, slender, ascending, very densely long-patent-hairy, greenish or faintly lilac; leaves 3–10 mm long, 2.5–10 mm wide, semiorbicular-triangular, with truncate base, obtuse or rounded at apex, with 3–5 rounded crenae on each margin, yellowish-grayish on both sides, densely villous-tomentose, with spreading hairs, rugose; petioles densely covered with long horizontally spreading hairs, to 6 mm long; inflorescence ca. 2.5–4 cm long, dense; lowermost bracts ca. 1 cm long, 6 mm wide; all bracts ovate, long-acuminate, scarious, with prominent longitudinal nerves, pale green or faintly lilac, densely covered all over with long white hairs; lower bracts few-toothed; appendage on upper
206 part of calyx 8–10 mm in diameter in fruit, pale green, densely long-villous; corolla to 2 cm long, with dull pink upper lip and yellow throat (according to collector's note), densely hairy and glandular outside; nutlets ca. 1.5 mm long, minutely punctate, densely covered all over with very fine hairs. August–September.

Stony places (limestone). — Centr. Asia: Pam.-Al. (Tadzhikistan). Endemic. Described from Gendedere ravine (between Bal'dzhuan and Karategin). Type in Leningrad.

128. **S. jodudiana** B. Fedtsch. in O. and B. Fedch. Perech. rast. Turk. V (1913) 158. — **S. physocalyx** var. **jodudiana** M. Pop. in sched.

Perennial with woody root and strongly branching rhizome; stems rather numerous, procumbent or ascending, slender, often filiform, herbaceous, slightly flexuous, 5–20 cm long, covered with short fine horizontally spreading white hairs, often faintly lilac; leaves 3.5–17 mm long, 3–15 mm wide, shorter or longer than internodes, semiorbicular to broadly ovate, with subcordate or truncate base, rounded or obtuse at apex, shallowly crenate-dentate with 1–4 (usually 3) large irregular rounded crenae on each margin, grayish-green on both sides, with short slightly crisp white hairs, these appressed above, more or less spreading beneath, the upper surface slightly rugose, the veins not or slightly prominent beneath; petioles covered with short spreading hairs, to 1.4 cm long; inflorescence a 4-angled spike, 2.5–5 cm long, many-flowered, dense or rather lax, at the ends of some of the branches; bracts 9–12 mm long, 3.5–9 mm wide, greatly exceeding calyx, broadly ovate to oblong-elliptic, tapering toward base, short-acuminate at apex, the lowermost subfoliaceous, others scarious, entire, white-villous with long spreading hairs, usually lilac-tinged, very rarely pale green; calyx ca. 3 mm long at anthesis, villous with long white hairs, the vesicular appendage on its upper part reaching 6–9 mm in diameter, strongly accrescent after flowering, often suffused with lilac, the longitudinal nerves prominent, palmately divergent; corolla small, 1.2–1.5 cm long, 3–5 mm wide at throat, often scarcely exceeding bracts, violet-purple, with whitish or yellowish tube; nutlets punctulate, with rather scattered fine stellate hairs, sometimes subglabrous. June–August. (Plate XII, Figure 1.)

Taluses, stony slopes, rock crevices in high-mountain belt. — Centr. Asia: Pam.-Al.
207 (**S. Tadzhikistan**). Endemic. Described from Roshan, Iodudi gorge on territory of Kala-i Vamar. Type in Leningrad.

129. **S. darvasica** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 418.

Perennial; similar to **S. jodudiana** B. Fedtsch., but stems somewhat stouter and tougher,

ascending or suberect; leaves 4–10 mm long and wide, with 4–8 (usually 5) smaller crenae on each margin, more densely pubescent, grayish, firmer, strongly rugose, with very prominent veins beneath; petioles to 6 mm long; inflorescence 2–5 cm long; bracts and calyx very densely villous; vesicular appendage on upper part of calyx ca. 5–8 mm across in fruit; corolla ca. 1.5 cm long, with yellow tube, the upper lip and its appendages very dark purple (almost black), the lower lip purple with a yellow spot at base. In all other characters like *S. jodudiana* B. Fedtsch. July–August.

Alpine mountain belt. — Centr. Asia: Pam.-Al. (Tadzhikistan). Described from northern slope of Darvaz Range, Gul'bed valley. Type in Leningrad.

130. *S. schachristanica* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 419.

Perennial; like *S. darvasica* Juz., but leaves more deeply incised-crenate, the grayish-green lower surface with more spreading hairs; bracts thinner, long-acuminate, pale green or faintly colored only in upper part, nearly all bracts with large marginal teeth, the longitudinal nerves prominent in dry state; corolla slightly larger, to 1.8 cm long, yellow, with lilac-tipped upper lip. July–August. (Plate XII, Figure 3.)

Mountain slopes (upper limit of Central Asian juniper zone). — Centr. Asia: Pam.-Al. (Turkestan Range). Endemic. Described from northern slope of Turkestan Range, Shakhristan mountain pass. Type in Leningrad.

Subgenus 3. *Anaspis* [Reching. fil. in Notizbl. Bot. Gart. u. Mus. Berlin-Dahlem, 15 (1941) 630–632, pro gen.] Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 420, pro sect. — Flowers in one-sided (dorsiventral) racemose inflorescence; cauline leaves gradually passing into bracts, these leaflike but much smaller, entire, short-petioled or subsessile; calyx accrescent, scarious or coriaceous, the upper part unappendaged but with distinct bulge at the middle, the lower part without a bulge, both parts falling away after ripening of fruit. Brittle, herbaceous or suffruticose plants, with thick leaves, varying in
208 vesture; usually growing on precipitous rocks and in their crevices.

A Central Asian group.

Note. We have not segregated this group into a genus, as proposed by Rechinger, because we are convinced of its close alliance with the subgenus *Euscutellaria* (and in particular with the section *Stachymacris* A. Hamilt.). The presence of a rudiment of scutellum on the upper lip of the calyx in species of the *Anaspis* group provides supporting evidence.

All the known species of this subgenus apparently vicariate with each other to form a specific series although, as regards the character of the inflorescence, they may be divided into two groups, the leading representatives being *S. hissarica* B. Fedtsch. and *S. schugnanica* B. Fedtsch., respectively.

1. Flowers in distant verticillasters forming very lax elongate inflorescences; both lips of (mature) calyx much longer than wide. 2.
- + Flowers in closely approximate verticillasters forming abbreviated inflorescences; lips of calyx as long as or slightly longer than wide 5.
2. Whole plant glabrous 131. *S. fedtschenkoi* Bornm.

- + At least calyx hairy all over 3.
3. Whole plant densely covered with medium or short, spreading, straight and crisp hairs, seemingly velutinous (especially lower side of leaves) 133. *S. velutina* Juz. et Vved.
- + Plants with different vestiture. 4.
4. Stems glabrous or with a very diffuse bloomlike coating of minute, almost papilliform hairs 132. *S. hissarica* B. Fedtsch.
- + Stems densely pubescent all over 5.
5. Pubescence bloomlike, consisting of minute papilliform hairs 134. *S. nevskii* Juz. et Vved.
- + Pubescence containing papilliform as well as long simple hairs. 135. *S. heterotricha* Juz. et Vved.
6. Stems glabrous or with scattered hairs 7.
- + Stems, like the whole plant, densely hairy 8.
7. Leaves sparsely or densely covered on both sides with short fine hairs. 136. *S. schugnanica* B. Fedtsch.
- + Leaves densely covered on both sides with appressed gladiate somewhat crisp hairs of medium length. 137. *S. lipskyi* Juz.
- 209 8. Plant villous with long multicellular somewhat crisp hairs interspersed with short-stipitate glands 138. *S. villosissima* Gontsch.
- + Plant velutinous with short or medium hairs 139. *S. holosericea* Gontsch.

131. *S. fedtschenkoi* Bornm. in Allgem. Bot. Zeitschr. Nos. 1-2 (1914) 8 (nomen); Beih. z. Bot. Centralbl. XXXVI, 2 (1918) 60 (descr.). — *S. hissarica* var. *fedtschenkoi* M. Pop. in Bot. mat. gerb. Bot. sada, V, 10 (1924) 154, cum var. *glabrescens* M. Pop. l. c. — *S. hissarica* var. *glabra* M. Pop. in sched. — *Anaspis fedtschenkoi* Reching. fil. in Notizbl. Bot. Gart. u. Mus. Berlin-Dahlem, 15 (1941) 630-632 (non vidi). — *lc.*: Reching. fil. l. c.

Perennial; caudex woody, branching; stems many, (30) 35-45 (50) cm high, slender, almost virgate, stiff (stems of previous year often persisting), obscurely 4-angled to subterete, completely glabrous, glaucescent, leafy, divaricately branching from middle, the branches slender, elongate, flexuous or pendulous, small-leaved, passing into inflorescence; lower cauline leaves 3-4 pairs, 2-3.5 cm long, 2-3 cm wide, approximately half the length of internodes (the latter 4-6 cm long), ovate, with shallowly cordate base, obtuse, with 2 or 3 large obtuse teeth on each margin (the very large terminal tooth often lobelike), or sometimes entire, glabrous, green, dull on both sides, the undersurface with a bloomlike coating of small scattered sessile glands; petioles glabrous, 5-18 mm long; upper cauline leaves (above insertion of first branches) entire; all leaves thick, flat, veins not prominent; leaves of lateral branches much smaller, orbicular, ovate or oblong-ovate to lanceolate, entire, subsessile, very distant, gradually passing into bracts; flowers in very loose one-sided few-flowered inflorescence consisting of 4-6 distant verticillasters, on pedicels ca. 1 mm long, horizontally spreading, as long as or shorter than internodes of inflorescence; calyx 4.5 mm long, 3-3.5 mm wide at flowering, campanulate, generally sparingly pubescent only at margin, otherwise with scattered sessile glands, in fruit 6.5 mm long, 4.5 mm wide, with short broad arched or truncate lips; corolla 12 mm long, more than twice the

length of calyx, blue, the straight tube gradually expanding into a short 2-lipped limb. August.

In crevices of shady precipitous rocks. — Centr. Asia: Pam.-Al. (southern slope of western part of Gissar Range, Baisun province). Endemic. Described from a ravine between Derbend and Akrobat. Type in Weimar, isotype in Leningrad.

132. *S. hissarica* B. Fedtsch. in O. and B. Fedch. Perech. rast. Turk. V (1913) 159. — *S. hissarica* var. *typica* M. Pop. in Bot. mat. gerb. Bot. sada, V (1924) 153. — *Anaspis hissarica* Juz. hoc loco (nom. alternat.).

Perennial; caudex woody, strongly branching at summit, stems numerous, 30–50 cm long, rather slender, obscurely 4-angled, almost virgate, green, glabrous or sometimes with barely discernible bloom of minute almost papilliform hairs, only in inflorescence distinctly covered with short horizontally spreading hairs intermixed with stipitate glands, simple or in upper part branching, the suberect branches varying in length; cauline leaves 5–6 pairs, 1.5–5.5 cm long, 1–4.5 cm wide, 1/3 to 1/2 as long as internodes (these 6–11 cm long), ovate, broadly ovate or nearly triangular-ovate, with slightly cordate base, obtuse; lower leaves sometimes subentire, mostly with 1–5 teeth on each margin, these large, low and broad, arcuate, crenate; middle and lower leaves of lateral shoots usually obscurely crenate, rounded at apex, short-petioled; upper leaves entire; all leaves thick, glabrous on both sides or covered on the veins beneath with scattered, minute subpapilliform spreading hairs, the veins prominent beneath; petioles 0.6–1.5 cm long; flowers in very loose one-sided, few-flowered inflorescence of 6–12 remote verticillasters (pairs of flowers), short-pedicelled; bracts small, 2–5 mm long, in fruit to 14 mm, 1/3 to 1/2 the length of calyx, broad-ovate or ovate, entire, obtuse, usually densely covered with very fine short appressed hairs, long-ciliate on margins, short-petioled or sessile; calyx at anthesis 3–4 mm long, 2.5–3 mm wide, in fruit to 8 mm long, 6 mm wide, densely covered with appressed or spreading fine hairs, often with some long stiff hairs and sessile glands, the lips very short, arcuate; corolla 1.7–2.2 cm long, more than twice as long as calyx, glandular and hairy outside, with slightly curved tube gradually expanding into a short 2-lipped limb, dark lilac, the lower lip pale; nutlets papillate-rugose. May–July. (Plate XIII, Figure 1.)

Crevices of precipitous rocks. — Centr. Asia: Pam.-Al. (Gissar). Endemic. Described from gorge of Karatag River near Khakimi. Type in Leningrad.

211 133. *S. velutina* Juz. et Vved. in Addenda XIX, 350. — *Anaspis velutina* Juz. hoc loco (nom. alternat.).

Perennial, very close to *S. hissarica* B. Fedtsch., but readily distinguished from the latter by the characteristic copious vesture of its parts, consisting of soft short spreading, both straight and crisp hairs, especially dense whitish-velutinous on underside of leaves; inflorescence erect or slightly curved, elongate; verticillasters distant, 0.5–2.5 cm apart; calyx with vesture of two components: shorter hairs as on other parts of the plant and less profuse long hairs. Otherwise, like *S. hissarica* B. Fedtsch. June.

Apparently on rocks (habitat not recorded by collector). — Centr. Asia: Pam.-Al. (Gissar Range). Endemic. Described from Varzob River valley. Type (collected by V. Titov in 1930) in Tashkent.

Note. In its vesture, this plant vividly recalls *S. holosericea* Gontsch. (see below)

from which, however, it differs strikingly in the remote verticillasters of its inflorescence, and this feature indicates kinship to *S. hissarica* B. Fedtsch. rather than *S. schugnanica* B. Fedtsch.

134. *S. nevskii* Juz. et Vved. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 424. — *S. hissarica* Nevski in Tr. Bot. inst. AN SSSR, I, 4 (1937) 322, non B. Fedtsch. s. str. — *Anaspis nevskii* Juz. hoc loco (nom. altern.).

Perennial, with woody branching caudex; stems few, 12–25 (40) cm long, subterete, glaucescent, with a dense bloomlike coating of minute papilliform hairs, these more profuse in inflorescence where color of stem usually turns dark violet; cauline leaves 3–4 pairs, 1–3.5 cm long, 0.5–2 cm wide, much shorter than internodes (usually 1/3 as long), ovate or broad-ovate, with truncate or rounded base, obtuse at apex, obscurely crenulate or almost entire, with hairs as on stems but scattered, denser on lower surface or leaves sometimes glabrous, with papilliform hairs confined to midrib and petiole and with scattered small sessile glands only beneath; petioles 0.4–1.6 cm long; flowers in lax one-sided inflorescence consisting of 3–6 pairs of flowers; bracts 2–5 mm long, 1–3 mm wide, narrowly ovate, entire, acute, with bloomlike vestiture as on vegetative parts; calyx ca. 6 mm long, 2.5–3 mm wide, nearly black-lilac, densely covered with minute papilliform hairs interspersed with small sessile glands; corolla 2–2.4 cm long, four times as long as calyx, 212 with nearly straight or slightly curved tube, 3.5–4 mm wide at throat, with lips to 3 mm long, apparently violet, covered with short spreading hairs and short stipitate glands; nutlets ca. 1 mm long, blackish-brown, finely tuberculate. Otherwise, similar to *S. hissarica* B. Fedtsch. June.

Walls of ravines in the juniper forest belt. — Centr. Asia: Pam.-Al. (Kugitang Range in Turkmen SSR). Endemic. Described from northwestern slope of Kugitang Range opposite Kugitang village. Type in Leningrad.

135. *S. heterotricha* Juz. et Vved. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 427. — *Anaspis heterotricha* Juz. hoc loco (nom. alternat.).

Perennial, 8–12 cm high, very similar to *S. nevskii* Juz. et Vved., but, in addition to minute hairs as in *S. nevskii*, with long simple spreading hairs, more copiously on axis of inflorescence, bracts and calyces, the upper side of leaves with scattered hairs, the lower side densely velutinous; lower leaves sometimes with subcordate base, in lower part with 3 large obtuse teeth (larger toward apex) on each margin, resembling leaves of *S. fedtschenkoi* Bornm.; inflorescence at onset of flowering 2.5–4 cm long, of 4–5 pairs of flowers; calyx ca. 5 mm long; corolla ca. 1.8 cm long. Otherwise, like *S. nevskii* Juz. et Vved. June.

Rocks. — Centr. Asia: Pam.-Al. (Tadzhikistan, Shirabad district). Endemic. Described from eastern slopes of Kugitang near Khodzhanika. Type in Leningrad.

136. *S. schugnanica* B. Fedtsch. in O. and B. Fedch. Perech. rast. Turk. V (1913) 159. — *S. hissarica* ssp. *schugnanica* M. Pop. in Bot. mat. gerb. Bot. Sada, V, 10 (1924) 154. — *Anaspis schugnanica* Juz. hoc loco (nom. alternat.).

Low subshrub; caudex stout, woody, strongly branching in upper part; stems numerous, crowded, 8–20 cm long, forming small tufts together with stems persisting from

previous year; stems 10–20 cm long, ascending or suberect, curved or slightly flexuous, obscurely 4-angled, brittle, with rather dense whitish bloomlike cover of minute hairs; leaves in 3–4 pairs, usually exceeding the shortish internodes, 0.6–4 cm long, 0.5–3.5 cm wide, broad-ovate, subcordate or truncate at base, obtuse or nearly rectangular at apex, coarsely crenate-dentate with 3–5 shallow obtuse teeth on each margin, sparsely or dense-
213 ly covered on both sides with short fine hairs, thickish, firm, the veins scarcely prominent beneath; petioles spreading, 0.5–3 cm long, with vesture as on stems; inflorescence short-racemose, 3–6 cm long, one-sided, with internodes 3–5 mm long, and axis covered with short and longer horizontally spreading hairs interspersed with stipitate glands; bracts elliptic-rhombic, 2–4 (7) mm long, patent-hairy, with solitary glands, tapering to short petiole, this as long as or slightly longer than pedicel; calyx ca. 3 mm long, 2.5 mm wide, in fruit 5.5 mm long, with hairs as on axis of inflorescence but longer and more copious; corolla 2–2.3 cm long, many times the length of calyx, ca. 3 mm wide at throat, pink-violet, puberulent outside, with lips ca. 3 mm long. June–July.

Rocks, crevices of bluffs. — Centr. Asia: Pam.-Al. (Shugnan, Darvaz). Endemic. Described from Pyandzh River valley between Khorog and Dasht and from Kergovat. Type and paratypes in Leningrad.

137. *S. lipskyi* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 420. — *S. hissarica* ssp. *schugnanica* var. *pubescens* M. Pop. in Bot. mat. gerb. Bot. sada, V (1924) 154. — *Anaspis lipskyi* Juz. hoc loco (nom. alternat.).

Perennial, low or medium-sized; caudex woody, branching at summit; stems rather numerous, erect, simple, 7–17 (25) cm long, slender, subterete, brittle, glabrous or covered in inflorescence with scattered short spreading hairs or with more profuse horizontally spreading hairs of medium length and numerous small short-stipitate glands, encircled at base with remnants of previous year's stems; leaves 2–4 pairs, 0.8–3 (3.5) cm long, 0.6–2.7 (3) cm wide, as long as or slightly longer than internodes, broadly ovate or nearly triangular-ovate, with subcordate base, obtuse at apex, fairly thin, shallowly crenate-dentate with 1–3 (4) large obtuse teeth on each margin, densely covered on both sides with appressed gladiate somewhat crisp hairs, the veins not prominent beneath; petioles slender, 0.3–1.5 (2) cm long, covered like stems, but more densely, with short and medium hairs; inflorescence 2–6 (8) cm long, consisting of 2–8 (10) approximate verticillasters; bracts rather large, 4–15 mm long, 2–10 mm wide, ovate or broad-ovate, obtuse, entire, with vesture like that of cauline leaves, short-petioled, at anthesis as long as or longer than
214 calyx, in fruit twice as long; pedicels short; calyx ca. 4 mm long, 3 mm wide, in fruit 5 mm long and wide, rather densely covered with long spreading hairs and short-stipitate glands; corolla ca. 2 cm long, several times the length of calyx, 3–4 mm wide at throat, sparingly pubescent and glandular outside, with slightly curved tube. June.

Steep walls of ravines. — Centr. Asia: Pam.-Al. (Yakkabag). Endemic. Described from Mushketov ravine. Type in Leningrad.

138. *S. villosissima* Gontsch. ex Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 421. — *S. hissarica* ssp. *schugnanica* var. *villosa* M. Pop. in Bot. mat. gerb. Bot. sada, V (1924) 154. — *S. schugnanica* var. *villosa* M. Pop. in sched. — *Anaspis villosissima* Juz. hoc loco (nom. alternat.).



PLATE XIII. 1 — *Scutellaria hissarica* B. Fedtsch., general aspect, bract, flower, fruiting calyx, nutlet; 2 — *S. baldshuanica* Nevski, general aspect, leaf, fragment of inflorescence, flower, fruiting calyx, its parts; 3 — *S. guttata* Nevski, general aspect, leaf, bracts, flower, fragment of fruiting inflorescence, fruiting calyx.

Perennial, of medium size; caudex woody, branching; stems rather numerous, erect, simple or slightly branching, 17–30 cm long, stout, obscurely 4-angled, brittle, covered with long spreading somewhat crisp white hairs intermixed with rather numerous small short-stipitate glands, in inflorescence almost villous with more copious and longer hairs and gland stipes; leaves in few pairs, 1–3.5 cm long, 0.8–3.2 cm wide, equaling or shorter than internodes, broadly ovate, with rather deeply cordate base, obtuse at apex, rather deeply and coarsely, unevenly dentate with (0) 2–5 teeth on each margin, densely covered on both sides with long spreading multicellular slightly crisp hairs interspersed with short-stipitate glands; petioles slender, 0.8–1.8 cm long, with hairs as on stems and on inflorescence axis; inflorescence (2) 3.5–5 cm long, consisting of (2) 3–6 subapproximate verticillasters; bracts 0.5–1.2 cm long, 3–7 mm wide, ovate or narrowly ovate, usually acute, with hairs as on leaves; petioles 2.5–6 mm long; calyx ca. 5 mm long, 3 mm wide, in fruit ca. 6 mm long, 4 mm wide, densely covered with long spreading hairs and stipitate glands; corolla ca. 1.8 cm long, with nearly straight tube, ca. 4 mm wide at throat. June.

Rocks. — Centr. Asia: Pam.-Al. (Guzar). Endemic. Described from upper reaches of Sangardak River, northern slope of Bel'-Auty Mountain. Type in Leningrad.

- 217 139. **S. holosericea** Gontsch. ex Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 423. — *Anaspis holosericea* Juz. hoc loco (nom. alternat.). — Ic.: Yuz., op. cit. 425, Figure 5.

Subshrub of medium size; caudex woody, 1–1.5 cm in diameter, branching at summit; stems few, 25–45 cm long, branching nearly from base or at summit; branches elongate, declined, curved or pendent, terminating like main stem in inflorescence, white with almost velutinous spreading somewhat crisp hairs of medium length; leaves 1.5–4 cm long, 1.2–3.2 cm wide, together with petiole about equaling internodes, broad-ovate or nearly triangular-ovate, with shallowly cordate base, obtuse at apex, irregularly or rather regularly, coarsely and rather deeply crenate-dentate with 4–8 apically rounded teeth on each margin, whitish-green, rather densely velutinous on both sides, on upper surface with stiffish nearly straight and softer somewhat crisp hairs, on the lower surface hairs straight, horizontally spreading along the veins, somewhat crisp elsewhere; petioles 0.5–2 cm long, horizontally spreading, with hairs as on stems; inflorescence 5–12 cm long, branching or compound, the branches rather long, in the axils of usually entire upper cauline leaves, the summit of inflorescence and the branches secund, often nodding, the component inflorescences 3–7 cm long, of 4–12 approximate verticillasters; bracts 0.3–1 cm long, 1.5–5 mm wide, ovate, acute, entire, densely white-hairy; petioles to 1 mm long, equaling or slightly exceeding calyx, the latter ca. 2.5 mm long, 2 mm wide, in fruit ca. 5 mm long and wide, densely covered with rather long spreading hairs and short-stipitate glands; corolla rather small, to 1.5 cm long, densely covered outside with fine crisp hairs, the tube very slender, to 1 mm in diameter, ca. 3 mm wide at throat, the lips ca. 2 mm long. To September.

Rocks (granite). — Centr. Asia: Pam.-Al. (western part). Endemic. Described from Shakhnut River valley, natural boundary Darai-Nikhan. Type in Leningrad.

Subgenus 4. **Apeltanthus** Nevski ex Pavlov in Tr. Sredneaz. Gos. univ. ser. VIII-c, ed. 19 (1935) 35 (nomen nudum genericum); Juz. in Bot. mat. gerb. Bot. inst. AN SSSR,

XIV (1951) 427 (pro sect.). — Inflorescence round or quadrangular in cross section (not dorsiventral); bracts herbaceous, similar to cauline leaves but sessile, smaller and narrower; calyx very slightly accrescent, concealed by bracts, the lips subequal, conchoid, the upper without appendage or distinct protuberance, persistent. Brittle usually rather densely patent-hairy and glandular, thin-leaved herbaceous plants, growing on precipitous outcrops and rocks. A Central Asian group.

Note. A unique group that may be phylogenetically related to the subgenus (or genus) *Anaspis*, but in any case could be formally connected with it. However, with fractional interpretation of the generic category, it would be better to separate it from *Anaspis* as an independent genus, on the lines proposed by Nevskii, inasmuch as it is possible to conceive of the group *Apeltanthus* as having evolved quite independently of *Anaspis* (most likely from the section *Lupulinaria*).

1. Flowers rather small, ca. 0.7–2 cm long, the tube to 1 cm long. 2.
- + Flowers larger, to 2.5–3 cm long, the tube to 2–2.5 cm long 5.
2. Inflorescences only terminal; corolla 1.2–2 cm long 3.
- + In addition to larger, terminal inflorescences, smaller lateral inflorescences produced in axils of upper cauline leaves or bracts; flowers smaller, not more than 1 cm long 4.
3. Leaves entire or nearly so, rarely with few flat crenations; flowers ca. 2 cm long 142. *S. poëcilantha* Nevski.
- + Leaves (at least some) with some well developed, large teeth; flowers 1.2–1.5 cm long 143. *S. macrodonta* Nevski.
4. Stems and leaves densely covered with minute hairs visible only under high magnification 140. *S. andrachnoides* Vved.
- + Stems and leaves covered with long spreading hairs and short-stipitate glands 141. *S. baldshuanica* Nevski.
5. Basic color of flowers yellow 6.
- + Flowers pink 148. *S. leptosiphon* Nevski.
6. Leaves densely covered on both sides with spreading soft white hairs 7.
- + Stems and leaves covered on both sides with spreading hairs and copious glands 8.
7. Lower lip of corolla not spotted 144. *S. orbicularis* Bge.
- + Lower lip of corolla with red spots 147. *S. rubromaculata* Juz. et Vved.
- 219 8. Lower lip of corolla not spotted 145. *S. immaculata* Nevski.
- + Lower lip of corolla with dark violet spots 146. *S. guttata* Nevski.

Series 1. *Baldshuanicae* Juz. — Inflorescences of two kinds: terminal and lateral, the latter much smaller; corolla-tube short.

140. *S. andrachnoides* Vved. in Addenda XIX, 350. — *Anaspis andrachnoides* vel *Apeltanthus andrachnoides* Juz. hoc loco (nom. alternat.).

Small subshrub; caudex woody, 0.5–1 cm long, branching at summit; stems several to many, ascending or erect, slender, brittle, simple, 4–12 cm long, straight or curved, glaucous with a dense bloomlike cover of minute hairs; cauline leaves commonly 2 pairs (not

counting leaves subtending inflorescence), 0.5–1.5 cm long, 0.3–1.3 cm wide, broadly ovate, with subcordate or rounded base, obtuse, entire or sometimes with 1–2 very indistinct teeth on each margin, glaucescent on both sides with a dense cover of minute hairs distinguishable only under high magnification, firm, coriaceous; petioles 0.5–2 mm long; terminal inflorescences ca. 2 cm long, ovoid-oblong, dense; lateral inflorescences, often developing in the axils of terminal (floral) leaves, much shorter (ca. 1 cm), short-ovoid; bracts 0.5–1 cm long, 2.5–6 mm wide, broad- to narrow-ovate, almost scarious, pale green, sparsely covered with long fine simple hairs and small short-stipitate glands, differing markedly from cauline and floral leaves in consistency, color and vestiture; calyx sparingly short-hairy and glandular, very slightly enlarging in fruit, ca. 2 mm long, subchartaceous; corolla small, ca. 1 cm long, sparsely short-hairy and finely stipitate-glandular. Fl. to September.

Rocks. — Centr. Asia: T. Sh. (E. Fergana). Endemic. Described from Kyzyl-Dzhar, Naryn River, natural boundary Ine-Sai. Type in Tashkent, isotype in Leningrad.

Note. This species differs sharply from the other members of the subgenus in its vestiture which approaches that of some members of the preceding subgenus (*Anaspis*); on the whole, it would seem to link the subgenera (if not converging with the species of 220 *Anaspis*). However, in consideration of the character of inflorescence it must undoubtedly be placed in the subgenus *Apeltanthus*.

141. ***S. baldshuanica*** Nevski ex Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 432. — *Anaspis baldshuanica* Juz. vel *Apeltanthus baldshuanicus* Juz. hoc loco (nom. alternat.).

Subshrub; caudex woody, 5–7 mm thick, with flexuous subimplexed nodose ramifications; flowering stems 2.5–7 cm long, ascending, curved or flexuous, slender, brittle, densely covered with long spreading white simple hairs and short-stipitate glands, producing 2–several pairs of leaves and branches in some of the axils, these branches mostly short, leafy (usually with 1 pair of leaves), terminating like main stem in small inflorescences, sheathed by upper pair of leaves; leaves 0.3–1.2 cm long, 0.4–1 cm wide, broad-ovate or suborbicular, rounded or retuse at apex, entire or very often with few (1–3) large crenations on each margin, with 5–7 veins strongly impressed above and very prominent beneath, almost plicate, sparsely or densely covered above with spreading hairs and short-stipitate glands, rather densely covered beneath with long spreading hairs and numerous short-stipitate glands, abruptly tapering to petiole, this short, with long spreading hairs and scattered stipitate glands; inflorescences ca. 1.5 cm long, 8 mm wide (the lateral ca. 8 mm long), ovoid, dense, few-flowered; bracts much smaller than upper leaves, to 8 mm long, 4 mm wide, narrowly ovate to ovate-lanceolate, tapering at base, sessile, subobtuse to subacute, differing markedly from cauline leaves in size and shape but with similar vestiture; calyx ca. 1 mm long at anthesis, the upper segment densely white-hairy, the lower glabrous; corolla small, ca. 7 mm long, pale lilac or whitish, with lilac upper lip; the tube short, 0.75 mm in diameter, not exerted from bracts, to 2 mm wide at throat, the upper lip ca. 2 mm long, the lower ca. 3 mm. July–August. (Plate XIII, Figure 2.)

Slopes, crevices of rocks and crags, limestone outcrops, conglomerate bluffs, red sands. — Centr. Asia: Pam.-Al. (Gissar). Endemic. Described from Nargubakh, eastern slope of Rengan plateau between Kafirnigan and Yavan. Type in Leningrad.

Series 2. *S. poëcilanthae* Juz. — Inflorescences all alike, terminal. Corolla-tube short and wide.

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142. *S. poëcilantha* Nevski ex Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 431. — *Anaspis poëcilantha* Juz. vel. *Apeltanthus poëcilanthus* Juz. hoc loco (nom. alternat.). — Ic.: Yuz., op. cit. 432, Figure 6.

Subshrub; caudex woody, ca. 1 cm thick, with numerous ramifications, these assurgent or spreading, covered with yellowish bark, distally bearing squamiform villous-hairy basal leaves; stems 5–15 cm long, slender, brittle, covered with horizontally spreading long fine soft hairs and short glands, commonly developing 2–3 pairs of leaves; leaves 0.6–2 cm long and wide, broad-ovate to orbicular, rounded at apex, entire or nearly so (sometimes deeply notched at one of the margins, rarely with 2–3 flat crenae), thin, sparsely or rather densely covered on both sides, more copiously beneath, with long fine spreading hairs and subsessile glands, cuneate at base, the slender petiole patent-hairy, 0.5–1.2 cm long, the veins beneath somewhat prominent at flowering time; inflorescences at ends of stems, at onset of flowering ca. 1.5 cm long (without flowers), in fruit to 3 cm, ovoid-spicate, dense; lowermost bracts to 2.5 cm long, 1.2 cm wide, resembling cauline leaves but narrower, others smaller, ovate or narrowly ovate, often (especially the upper) subacute, the longitudinal nerves on lower surface very prominent in fruit; calyx in flower to 2 mm long, in fruit ca. 3 mm long, densely patent-hairy; corolla ca. 2 cm long, mainly white, the tube to 1 cm long (largely concealed by bracts), to 2 mm thick; lips large, the upper 8 mm long, pale or purple-tinged, the lower ca. 6 mm long, mottled with dark purple, interrupted stripes and spots. July.

Rocks. — Centr. Asia: Pam.-Al. (basin of Upper Zeravshan). Endemic. Described from Yagnob River north of Anzob. Type in Leningrad.

143. *S. macrodonta* Nevski ex Juz. sp. nov. in Addenda XIX, 351. — *Anaspis macrodonta* vel *Apeltanthus macrodontus* Juz. hoc loco (nom. alternat.).

Perennial; similar to the preceding species, but leaves often bearing to 3 large obtuse or rounded teeth on each margin; bracts broader and more acute than in *S. poëcilantha*; flowers exceptionally small, ca. 1 cm long. Otherwise, like *S. poëcilantha* Nevski. June–July.

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Granite rocks. — Centr. Asia: Pam.-Al. (Gissar Range). Endemic. Described from Sardai-Mion River valley south of Vistap. Type (B. A. Fedchenko, No. 506) in Leningrad.

Series 3. *Orbiculares* Juz. — Inflorescences alike, terminal; corolla-tube long and slender.

144. *S. orbicularis* Bge. in Mém. prés. Ac. Sc. Pétersb. div. sav. VII (1854) 436, s. str. — *S. sericophylla* Nevski in sched. — *Anaspis orbicularis* Juz. vel *Apeltanthus orbicularis* Juz. hoc loco (nom. alternat.).

Subshrub; caudex woody, twisted, ca. 1 (to 2) cm thick, strongly branching from base; branches divaricate, prostrate, mostly flexuous, branching in turn and forming small tufts; green shoots 2–9 cm long, slender, brittle, the vegetative densely leafy, the fertile with

1–2 distant pairs of leaves, usually densely covered with spreading white soft hairs; leaves 4–15 mm long, 3–15 mm wide, broad-ovate or obovate to orbicular, rounded-obtuse at apex, entire or sometimes with 1–3 shallow notches on each margin, densely covered on both sides with long soft appressed hairs, grayish-villous to whitish-sericeous, abruptly or gradually attenuate at base, usually with 7 veins (including midvein), these usually depressed above, prominent beneath; petiole about as long as blade (3–15 cm); leaves of sterile shoots slightly smaller, at first very densely silky lanate-villous; inflorescences at ends of fertile shoots, spicate-capitate, subglobose, 0.8–2 cm long (not including flowers), finally elongating to 2.5 cm; bracts tightly crowded, herbaceous, the lowermost to 1.2 cm long, 1 cm wide, similar in every respect to cauline leaves but sessile, the others gradually decreasing in size, thicker, orbicular-obovate to ovate, tapering at base, acute at apex; flowers 12–15; calyx sessile, at anthesis ca. 2 mm long, the upper segment rounded at apex, with an obsolescent dorsal protuberance but even in fruit unappendaged, densely covered with long silky hairs, the lower segment slightly shorter than the upper, very slightly emarginate, with very fine silky hairs, in fruit neither segment increasing significantly in size, ca. 3 mm long, coriaceous, falling away separately; corolla 1.7–2.8 cm long, straw-colored, slightly glandular and pubescent outside, with long upcurved tube and large limb, to 5 mm wide at throat; nutlets brown, dull, glabrous. May–September.

223 *S. suberosa* Nevski (usually precipitous). — Centr. Asia: Pam.-Al. Endemic. Described from Zeravshan. Type in Leningrad.

145. *S. immaculata* Nevski ex Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 428. — *S. orientalis* var. *sewerzowii* Herder in Bull. Soc. Nat. Mosc. XLI, II (1868) 387. — *S. suberosa* Nevski in sched. — *S. gymnocarpa* Nevski in sched. — *Anaspis immaculata* Juz. vel *Apeltanthus immaculatus* Juz. hoc loco (nom. alternat.).

Subshrub; caudex stout, woody, usually erect, twisted; ramifications numerous, short or long, with thick yellowish-brownish corky bark, their upper part and the lower part of stems densely covered with very crowded small squamiform obovate densely long-white-villous lower leaves; flowering shoots 3–15 cm long, slender, brittle, densely covered with long spreading white hairs, bearing 2–3 pairs of leaves; leaves 0.6–2 cm long, 0.5–1.7 cm wide, orbicular-ovate, rounded or angled at apex, entire or nearly so, grayish-green, with rather profuse fine spreading white hairs and numerous (especially beneath) sessile glands, thinly coriaceous, mostly with 5 prominent veins beneath, abruptly cuneately tapering to petiole 6–10 mm long; inflorescence 1–2 cm long (without corollas), dense, capitate, in fruit to 5 cm long, ovoid to oblong-ovoid; bracts like cauline leaves but slightly narrower, acute, sessile, persistent in fruit, the lower 1.2–1.5 cm long, 7–9 mm wide; calyx to 2 mm long at anthesis, later ca. 2.5 mm long, the upper segment sparingly pubescent or subglabrous, the lower with few sessile glands; corolla 2.2 cm long, pale yellow, the tube rather long, 1.5–2 mm in diameter, to 5 mm at throat, the upper lip ca. 7 mm long, the lower to 8 mm, not spotted; nutlets to 1.5 mm long, brown, sparsely and finely papillose-tuberculate. May–August.

Rock crevices, precipitous stony ravine walls. — Centr. Asia: T. Sh. (western part), Pam.-Al. (foothills). Endemic. Described from Chatkal north of Brichmulla and from Mashat (S. Kazakhstan). Type and paratypes in Leningrad.

Note. Nevskii designated specimens of *S. immaculata* from Mogol-Tau mountains as *S. gymnocarpa* and specimens from the foothills of Pamir-Alai as *S. suberosa*.

146. **S. guttata** Nevski ex Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951)
 429. — *Anaspis guttata* Juz. vel *Apeltanthus guttata* Juz. hoc loco (nom. alternat.).
- 224 Subshrub; caudex woody, long, flexuous, loosely branching in upper part, its branches gray-brown, nodose, often bearing in upper part numerous orbicular squamiform villous-hairy basal leaves; fertile shoots (stems) 5–10 cm long, usually ascending, simple or few-branched, slender, brittle, covered with horizontally spreading long fine simple hairs and very copious short and long glandular hairs; cauline leaves few, 0.6–1.5 cm long, 0.5–1.2 cm wide, broadly ovate or suborbicular, generally rounded at apex, entire or nearly so, dull green, sparsely covered on both sides with long spreading hairs and numerous stipitate glands, with glandular hairs of varying length, often abruptly tapering to petiole 2–7 mm long; inflorescence at onset of flowering ca. 2 cm long (not including flowers), dense, ovoid-capitate, after flowering reaching up to 8 cm, narrowly cylindrical or columnar, some closely approximate; bracts narrower than cauline leaves, ovate, usually acute and slightly revolute at apex, the lower ca. 1 cm long, 7 mm wide; calyx ca. 1.5 mm long at anthesis, with densely stipitate-glandular upper and glabrous lower segment; corolla to 2.5 cm long, bright yellow; tube 1.75–2 mm across, ca. 4 mm across at throat; upper lip ca. 5 mm long; lower lip ca. 6 mm long, with 9–18 small round dark violet spots, these somewhat randomly though fairly evenly disposed, sometimes confluent in pairs. June–September. (Plate XIII, Figure 3.)
- Sandstone outcrops. — Centr. Asia: Pam.-Al. (Tadzhik SSR, basin of Tupalang River). Endemic. Described from Gissar, Duob and Zambat. Type and paratype in Leningrad.
147. **S. rubromaculata** Juz. et Vved. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951)
 430. — *Anaspis rubromaculata* Juz. vel *Apeltanthus rubromaculatus* Juz. hoc loco (nom. alternat.).
- Perennial; apparently a very stenotypic species, of somewhat composite character; its vesture resembles closely that of *S. orbicularis* Bge., to which it is most closely allied, while the red (not dark violet) spots on the lower lip of the corolla are of the same size and shape as in *S. guttata* Nevski. May.
- Habitat unknown. — Centr. Asia: Pam.-Al. (Zeravshan). Endemic. Described from Zeravshan valley, Naufin-Kul' Lake. Type in Leningrad.
- 225 148. **S. leptosiphon** Nevski in Tr. Bot. inst. AN SSSR, I, 4 (1937) 324. — *S. propinqua* Nevski in sched. — *S. microcalycina* Nevski in sched. — *Anaspis leptosiphon* Juz. vel *Apeltanthus leptosiphon* Juz. hoc loco (nom. alternat.). — Ic.: Nevskii, op. cit., Figure 13 (p. 323).
- Cespitose subshrub; caudex twisted, usually decumbent, woody, strongly branching from base, the branches covered with yellowish-gray corky bark and often bearing basal leaves in upper part, these squamiform, orbicular-obovate, ca. 3 mm long, tapering toward base; flowering shoots mostly ascending, 3–8 (15) cm long, slender, with 1–3 pairs of leaves; leaves 8–17 mm long, 7.5–15 mm wide, orbicular-ovate, entire or very rarely obscurely crenate-dentate, covered, more copiously beneath, with fine white spreading hairs and stipitate glands, abruptly tapering to petiole, this 3–6 (10) mm long; inflorescence ovoid-capitate, 1–2 cm long (not including corollas); bracts similar to cauline leaves but sessile, ovate, subacute; pedicels 0.5–1 mm long; calyx at anthesis to 2 mm long, after

flowering 2.5–3 mm long, both segments rounded at apex, the upper with low protuberance and long white hairs, the lower slightly shorter, scarcely glandular at base; corolla 3 cm long, pale pink, the tube very long, much exserted, curved upward, glandular-hairy outside, 1–1.25 mm thick, the upper lip mitriform, short-winged laterally, glandular on the back, ca. 5 mm long, the lower lip ca. 6 mm long, suborbicular, with a purple-lilac spot at middle and numerous small violet dots. June–July.

Limestone rocks. — Centr. Asia: Pam.-Al. Endemic. Described from foothills of Kugitang Range near Kugitang village. Type in Leningrad.

Subfamily 3. **LAVANDULOIDEAE** Briq. in Bull. Herb. Boiss. II (1894) 715; id. in Pflanzenfam. IV, 3a (1895) 207 et 227. — Calyx 13–15-nerved, 2-lipped, of the $\frac{3}{2}$ or $\frac{1}{4}$ type; corolla 2-lipped of the type $\frac{2}{3}$; stamens 4, included and curved downward; anthers with 2 spreading cells fusing at apex; ovary 4-parted; nutlets with spinobasal attachment; disk lobes liguliform, opposite ovary cells and nutlets; embryo straight, with straight short radicle.

226 Genus 1245.* **Lavandula**** L.

L. Syst. ed. 2 (1740) 25.

Calyx tubular, 13–15-nerved, 2-lipped, the upper lip 1-toothed, the lower with 4 equal teeth; corolla blue or violet, with exserted tube, 2-lipped, the upper lip of 2, the lower lip of 3 orbicular, more or less flat lobes; stamens 4, not exserted from corolla, the lower longer than the upper; style 2-cleft above; nutlets with smooth shining surface, yellowish-brown. Subshrubs or small shrubs, rarely perennial herbs, with entire, linear or lanceolate-linear, obtuse, sometimes pinnatifid leaves.

More than 20 species distributed from the Canary Islands to India and Pakistan are represented in the genus.

1. **L. spica** L. Sp. pl. (1753) 572 var. β . exclud. — **L. vulgaris** var. α . Lam. Fl. Franc. II (1778) 403. — **L. spica** L. α . *angustifolia* L. fil. in Amoen. Acad. 10 (1790) 58. — **L. officinalis** Chaix in Vill. Hist. pl. Dauph. I (1786) 355. — **L. fragrans** Salisb. Prodr. (1796) 78. — **L. vera** DC. in Lam. et DC. Fl. Franc. V (1815) 398. — **L. spicata** Eaton, Man. Bot. N. Amer. (1817) 65. — **Lc.**: Komarov, Sbor, sushka i razved. lekarstv. rast., 3rd. ed., Plate 26 (1917); Rchb. Ic. Fl. Germ. XVIII, tab. 1227.

Subshrub 20–100 cm high; branches numerous, ascending or erect, strongly branching; leaves oblong-linear, entire, obtuse, revolute, gray-tomentose when young, 2–6 cm long, 2–6 mm wide; flowers in 6–10-flowered verticillasters at ends of stems, forming an interrupted spiciform inflorescence; bracts rhombic-ovate, acuminate, short, 3–5 mm long;

* Treatment by B.K. Shishkin.

** From the Latin lavare — to wash, referring to the use of lavender in the bath by the ancient Greeks and Romans.

calyx 4–5 mm long, rather densely covered with white hairs, with 5 obtuse, very short teeth; corolla 1 cm long, violet, twice the length of calyx.

Cultivated for its valuable essential oil in the Crimea, Caucasus and Central Asia. **Gen. distr.:** W. Mediterranean region. Described from S. Europe. Type in London.

227 **Note.** Another species of *Lavandula* — *L. latifolia* (L.) Vill., distinguished by its broader leaves and linear bracts, is also cultivated for its essential oil which is known as oil of spike. It is similar to oil of lavender but of somewhat inferior quality.

Economic importance. Lavender was used for its perfume by the ancient Romans. The essential oil is contained in epidermal cells of the leaves, in glandular hairs and, in appreciable amount, in the calyx. It is obtained by steam distillation of inflorescences and vegetative parts of the plant. An extract is also obtained by applying solvents (for example, benzene) to the inflorescence. Freshly collected plants yield 0.8% oil and dried plants up to 1.5%. The most valuable component is linalyl acetate. The distilled oil has a pleasant aroma; it is slightly bitter in taste and faintly yellowish-green in color. Lavender oil is used in the production of perfumes, soap and other cosmetics. It is one of the principal constituents of eau de Cologne.

Subfamily 4. **DREPANOCARYOIDEAE*** Pojark. subfam. nova in Addenda XIX, 351. — Calyx 18–20-nerved, nearly straight at throat, obliquely inflated at base; corolla 2-lipped of the $\frac{2}{3}$ type; stamens 4; anthers diverging at an obtuse angle of over 180° and thus the locules projecting upward; ovary 4-partite, with style attached to base of lobes. Nutlets with basiventral attachment, falcately curved along longitudinal axis so that the ventral side appears concave and the dorsal side strongly convex, semi-globular; each nutlet attached by a large surface of contact (occupying its entire ventral side) to the outer concave side of one of 4 large lunate apical appendages of the disk, these alternating with the liguliform disk-lobes (disk-lobes finally scarcely visible). Embryo slightly curved, with fleshy cotyledons and radicle turned downward and attached at base of cotyledons.

Type of subfamily — genus *Drepanocaryum* Pojark.

Note. The characters which sharply distinguish the genus *Drepanocaryum* from other Labiatae are as follows: 1) basiventral attachment of nutlets, 2) shape of the nutlets: curvature along the longitudinal axis and surface of attachment occupying the whole ventral side, 3) presence of 4 large disk appendages (4-lobed gynophore) to which the nutlets are attached; the latter feature belongs to the category of characters which underlie the division of the Labiatae family into subfamilies. On this basis the genus *Drepanocaryum* is segregated into a subfamily.

228 Genus 1246. ***Drepanocaryum***** Pojark.

Gen. nov. in Addenda XIX, 352.

Calyx erect, gibbous at base, without a ring of hairs inside, 18–20-nerved, nearly straight at throat, the lower teeth longer than the upper; corolla-tube glabrous inside; upper lip of

* Treatment by A.I. Poyarkova.

** From the Greek *drepanon*, sickle and *caryon*, seed (in this case, the nutlet).

(229)

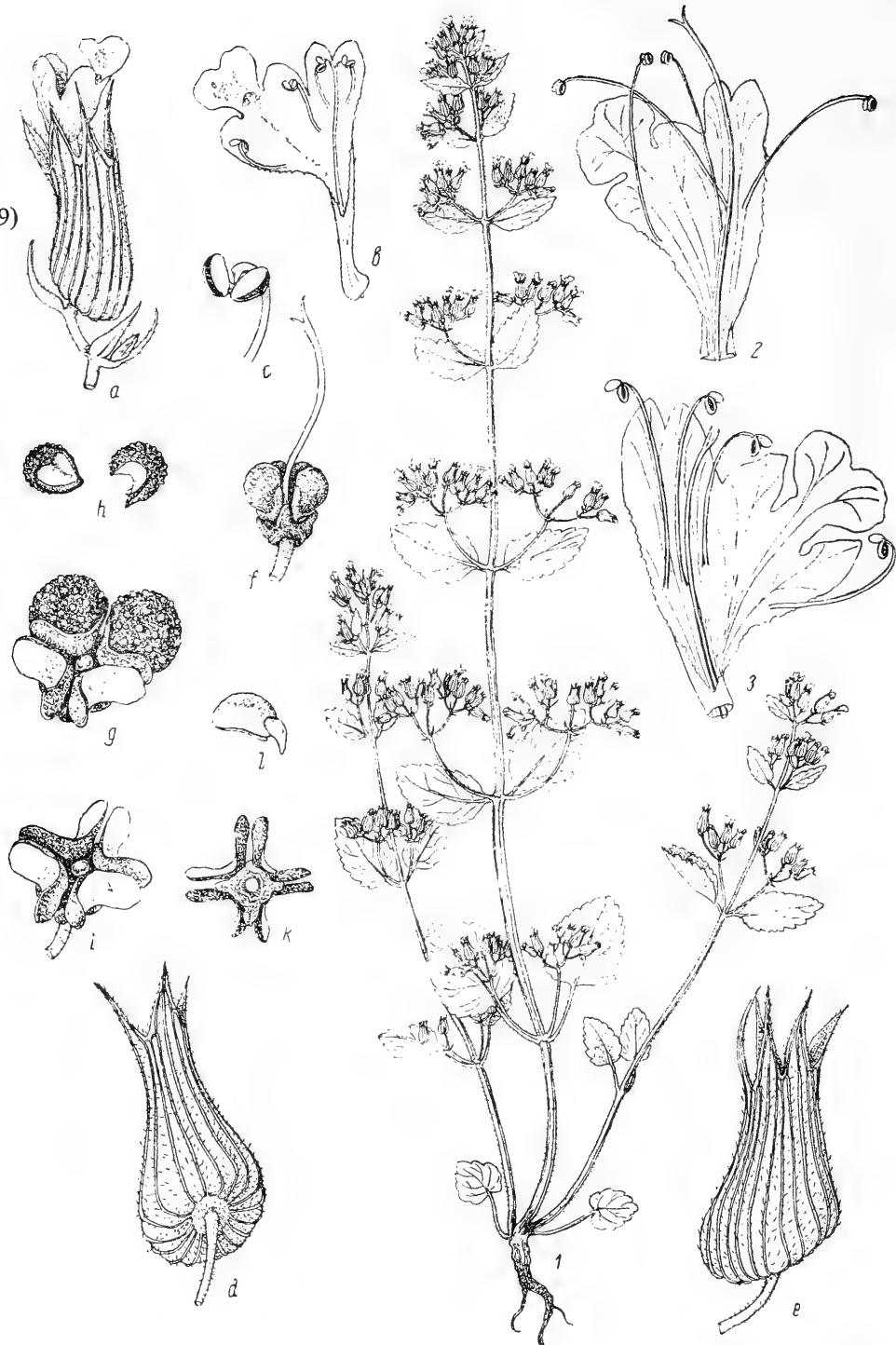


PLATE XIV. 1 – *Drepenocaryum sewerzowii* (Rgl.) Pojark., a) flower unfolded, b) corolla unfolded, c) stamen, d) fruiting calyx in rear view, e) same in side view, f) early stage of fruiting (note disk with appendages (gynophore) enclosing nutlets), g) advanced stage of fruiting (2 nutlets removed), h) mature nutlets in bottom and side view, i) gynophore in side view (after shedding of nutlets), k) the same in bottom view (note disk), l) embryo; 2 – *Agastache rugosa* (Fisch. et Mey.) O. Ktze., flower unfolded; 3 – *Schizonepeta multifida* (L.) Briq., flower unfolded.

corolla 2-lobed; lower lip with erect lateral lobes, the flat cuneate middle lobe directed upward; stamens arcuately ascending under upper lip of corolla, the upper longer than the lower, all fertile; anther cells not confluent; style with 2 unequal lobes; nutlets coarsely tuberculate. Annual plants, with flowers in remote cymes. Type and only representative — *D. sewerzowii* (Rgl.) Pojark.

1. *D. sewerzowii* (Rgl.) Pojark. comb. nov. — *Nepeta sewerzowii* Rgl. in Tr. Bot. sada, VI (1879) 360; Aitch. in Trans. Linn. Soc. 2 ser. III, 147; Lipsk. in Tr. Bot. sada, XVIII, 101; O. and B. Fedch. Perech. rast. Turk. V, 147. — **lc.**: Aitch. l. c. tab. 41.

Annual; root slender, short; stems 6–60 cm long, erect or ascending, slender, often flexuous, usually simple, rarely with 1–2 pairs of leafy fertile branches in lower part, more or less densely covered with hairs, these very small (magnifying glass!), spreading, simple, 2 (3)-cellular, thickened proximally, sometimes interspersed with coarser and longer hairs; leaves thin (chartaceous when dry), bright green, sparsely, rarely densely, covered on both sides with simple coarse jointed hairs, these appressed above, more or less spreading beneath, and sparsely punctate with soon deciduous yellow glands, ovate or cordate or the upper often narrower, oblong-ovate or ovate-elliptic, obtuse, rarely acute, the lower and middle leaves to 4 cm long, 3.5 cm wide, upper leaves often nearly half as long, the margin with large obtuse or acute teeth; petioles slender, patent-hairy or downy, in lower leaves
231 equaling or longer than blade, decreasing in size toward summit, the uppermost 1.5–2 mm long; cymes in axils of all leaves (except sometimes the lower with axillary branches); leaves exceeding peduncles, sometimes barely as long; peduncles slender, 4.5–6 cm long; upper cymes 3–8-flowered, usually dense, the others 8–20-flowered, loosely dichotomously branching; floral leaves linear-subulate, 2–3 mm long; bracts slightly smaller, shorter than pedicels, these 1.5–3 mm long, in case of bifurcation to 5–10 mm long; all axial parts of inflorescence densely covered with very short simple spreading hairs, sometimes with admixture of capitate glands; calyx 6–7.3 mm long, green or violet at anthesis, nearly tubular, distinctly gibbous at base, in fruit broader, ovoid, strongly inflated, membranous, with thickish nerves, short-patent-hairy, the teeth half as long as tube, the 3 upper lanceolate-triangular, 2–2.3 mm long, the two lower longer, 2.2–2.5 mm, narrower and long-acuminate, all terminating in a hard but not spiny point and lined inside with long appressed hairs; corolla (blue or lilac) 6–6.7 mm long, included in calyx to limb or even higher, hairy outside; tube 3.7 mm long, gradually dilated into narrowly infundibular neck, 1.3–1.7 mm long; upper lip 0.8–4 mm long, deeply cut into semiorbicular-ovate obtuse lobes; lower lip twice as long as the upper, the lateral lobes about equaling the lobes of upper lip, 0.7–0.8 mm long and as wide, the middle lobe 1.4–2 mm long and wide, cuneate, notched at apex, flat, entire; nutlets 0.7–0.8 mm long, 1–1.2 mm wide, subglobose above, concave at lower end, black, coarsely tuberculate. Fl. second half of April–first half of July; fr. May–July (August). (Plate XIV, Figure 1.)

Lower and middle mountain belt, 700–2000 m, ravines, stony and gravelly slopes in the shade of rocks and trees. — Centr. Asia: Mtn. Turkm. (Greater Balkhan Range, Kopet-Dagh), Kyz. K. (Aktau mountains), Pam.-Al. (all mountains, apparently, except for Shugnan and Pamir), T. Sh. (mountains of Kara-Tau and W. T. Sh.). **Gen. distr.**: Iran (Badgyz mountains in Afghanistan and Baluchistan). Described from Mogol-Tau mountains. Type (lectotype) in Leningrad.

Subfamily 5. **STACHYDOIDEAE** Briq. in Pflanzenfam. IV, 3a (1895) 307 et 329. — Calyx varying in shape; corolla 2-lipped, of the $\frac{2}{3}$ type, rarely almost regular, the tube cylindrical or rarely campanulate; stamens 4, rarely 2, ascending or turned forward; ovary 4-partite, lobes of disk alternate with lobes of ovary; nutlets obovoid, with small basal surface of attachment; embryo with short straight radicle.

- 232 Tribe 1. **MARRUBIEAE** Endl. Gen. (1838) 627; Benth. in DC. Prodr. X, 407; Briq. in Pflanzenfam. IV, 3a, 207. — Calyx tubular or campanulate, with prominent nerves, 5–10-toothed; corolla-tube included in calyx, rarely exserted; stamens and style included in corolla-tube.

Genus 1247.* **Thuspeinantha**** Durand.

Ind. Gen. Phan. (1888) 703. — *Tapeinanthus* Boiss. Diagn. Ser. 1, 12 (1848) 68; Boiss. ex Benth. in DC. Prodr. XII, 446; non Herb. (1837).

Calyx broadly campanulate, 10-nerved, slightly 2-lipped, nearly regular, herbaceous, with very short broadly triangular teeth, two of which slightly longer and less deeply cut, glabrous at throat, inflated in fruit; corolla-tube long, slender, exserted from calyx, slightly dilated at throat, without hairy ring inside; upper lip 2-lobed, the lobes small, obtuse, oblong-lanceolate, flat; lower lip 3-lobed, the lobes flat, the middle one broader; stamens 4, not exserted from throat of corolla, attenuate or ascending, nearly parallel, the lower slightly longer; filaments short; anthers with coalescent cells, almost unilocular, oblong, attached to filaments at middle; style bipartite, the truncate upper lobe sheathed at base by the lower lobe; nutlets large, oblong, slightly attenuate at base, obtuse at apex, keeled on the ventral side. Small annual herbs, with opposite petiolate leaves.

Two species of the genus are confined to desert habitats in Central Asia, Iran and Afghanistan.

1. **T. persica** (Boiss.) Briq. in Pflanzenfam. IV, 3a (1897) 229; O. and B. Fedch. Perech. rast. Turk. V (1913) 162; Fedch. Rast. Turk. (1915) 672. — *Tapeinanthus persicus* Boiss. Diagn. Ser. 1, 12 (1848) 63; Boiss. ex Benth. in DC. Prodr. XII, 436; Boiss. Fl. or. IV, 679. — *Chamaesphacos persicus* (Boiss.) Aitch. et Hemsl. in Transact. Linn. Soc. Ser. II, III (1888–1894) 97. — **Ic.:** Aitch. et Hemsl. l. c. tab. XLII, fig. 1–6.

A small glandular-viscid annual, dull green, simple or branching from base; stems erect; leaves 1-veined, obtuse, entire or obscurely dentate, 1.5–2.5 cm long, the lower oblong, ca. 2.5 cm long, 5–7 mm wide, longer than the upper, lanceolate to oblong-lanceolate, all leaves petiolate, the lower with longer petioles; flowers paired on short peduncles in axils of upper leaves; calyx 6–7 mm long, with short glandular hairs around the teeth inside and outside, the teeth broadly triangular, acute, at anthesis $\frac{1}{6}$ as long as the tube,

* Treatment by A.G. Borisova.

** From the Greek *tuspein* and *anthos*, flower.

in fruit larger, the whole calyx enlarging sacciformly, with open throat; corolla 12–15 mm long, white or pink, with long tube, dilated at throat; nutlets over 3 mm long, 1.5 mm wide, broadening and obtuse at apex, with sessile glands at base, with fine hairs on both faces, convex on the outside, flat and keeled on ventral side. Flowers March–April, fruit April–June.

Sands in deserts, red sandstone, pebbly places. — Centr. Asia: Ar.-Casp., Kara K., Kyz. K. **Gen. distr.:** Iran. Described from Iran. Type in Geneva.

Genus 1248.* **Marrubium**** L.

L. Sp. pl. (1753) 582; N. Pop. in Protok. Obshch. estestv. Yur'evsk. univ. XXIII, 4 (1916).

Calyx tubular, 5–10-nerved, 5–10-toothed, the teeth equal or the alternate shorter, erect or declined and reflexed; corolla 2-lipped, the tube shorter than calyx, rarely exerted; upper lip of corolla erect, nearly flat, narrow, notched or 2-lobed; lower lip declined, 3-lobed, with the middle lobe broader, often notched, the lateral lobes oblong; stamens 4, included in corolla-tube, the upper shorter than the lower; anther cells divaricate, apically coalescent and dehiscent by a common slit; lobes of style short, obtuse; nutlets trigonous-ovoid or oblong, rounded at apex. Perennial, very rarely annual, frequently white-tomentose-lanate plants, with stellate fasciculate multicellular hairs; inflorescence of small flowers in usually dense axillary verticillasters, with subulate or setaceous bracts.

Upward of 40 species distributed in Europe, N. Africa and extratropical Asia.

Economic importance. All species of the genus provide a source of tanning agents and dyes (with ferrous salts they yield an excellent black color). Some of the species are nectariferous and some have medicinal value (see Note to *M. vulgare* L.).

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- 1. Calyx (6) 8–10-toothed, the auxiliary (commissural) teeth as long as or slightly shorter than the principal teeth 2.
 - + Calyx 5-toothed (very rarely 6–7 and then very small). 6.
 - 2. Calyx-teeth erect 3.
 - + Calyx-teeth recurved 4.
 - 3. Calyx-teeth subulate-lanceolate; corolla white, twice as long as calyx; leaves oblong-ovate, entire at base, crenate-serrate above 4. **M. praecox** Janka.
 - + Calyx-teeth subulate; corolla purple, slightly exerted from calyx; leaves semiorbicular, crenate 3. **M. woronowii** N. Pop.
 - 4. Bracts curved, 1/3–1/2 as long as calyx; corolla whitish-yellowish, scarcely exerted from calyx-tube 5. **M. parviflorum** Fisch. et Mey.

* Treatment by O.E. Knorring.
 ** Name used by many Latin authors for various species of the genus and also for some other Labiatae. It appears to derive from the Hebrew words *mar*, bitter and *rob*, much (i.e. “very bitter”), but Linnaeus formed it from “Maria-Urbs” (town on Lake Fitin in Latium).

- + Bracts as long as or longer than calyx; corolla pink, white or yellow, somewhat exerted from calyx-tube 5.
- 5. Calyx-teeth divergent, hamate; corolla white, slightly longer than calyx; nutlets oblong-ellipsoid 1. *M. vulgare* L.
- + Calyx-teeth slightly curved or straight, not hamate; corolla pink or pale yellow, half as long again as calyx; nutlets obovoid 2. *M. alternidens* Rech.
- 6. Calyx-teeth erect 7.
- + Calyx-teeth recurved. 10.
- 7. Corolla white; inflorescence branching with horizontally spreading branches. Leaves oblong-rhombic at base, entire, crenate-serrate above 12. *M. peregrinum* L.
- + Corolla pinkish-violet or purple 8.
- 8. Inflorescence branching; upper verticillasters confluent; stems coarse, thick, covered with stellate hairs; leaves broadly ovate, nearly as wide as long 14. *M. purpureum* Bge.
- + Inflorescence not branching; stems numerous, slender; upper verticillasters not confluent; leaves narrower, ovate or orbicular 9.
- 9. Leaves orbicular, obtusely toothed at margin; corolla purple 13. *M. goktschaicum* N. Pop.
- + Leaves ovate, entire, sparsely toothed only at apex; corolla lilac 15. *M. turkeviczii* Knorr.
- 235 10. Entire plant niveous-tomentose with fine flexuous hairs; leaves orbicular, with short unequal teeth 11. *M. persicum* C.A.M.
- + Grayish-green plants, covered with bristly or stellate multicellular hairs 11.
- 11. Annuals, divaricately branching from base; leaves ovate, coarsely crenate; corolla white or pink, with long-exserted tube 7. *M. catariifolium* Desr.
- + Perennials 12.
- 12. Calyx-teeth nearly as long as calyx-tube; leaves reniform, coarsely crenate 6. *M. plumosum* C.A.M.
- + Calyx-teeth 1/3 to 2/3 as long as tube 13.
- 13. Plant 9–25 cm high; stems solitary, not branching; cauline leaves obovate, finely toothed 9. *M. nanum* Knorr.
- + Plant 30–60 cm high; stems branching; cauline leaves ovate 14.
- 14. Leaves covered on both sides with stellate hairs, with simple hairs along veins beneath; upper lip of corolla much longer than the lower 8. *M. leonuroides* Desr.
- + Leaves covered on both sides, more densely beneath, with fascicled as well as glandular hairs; upper lip of corolla as long as the lower 10. *M. propinquum* Fisch. et Mey.

Section 1. *Marrubium* Benth. Lab. gen. et sp. (1834) 588. — Calyx-teeth 5–10; upper lip of corolla notched or 2-cleft; bracts linear; leaves orbicular or ovate, toothed or crenate, rarely incised.

Subsection 1. *Decemdentata* Briq. in Pflanzenfam. IV, 3a (1897) 230. — Calyx-teeth 6–10, of which the auxiliary (commissural) as long as or shorter than the principal teeth.

1. **M. vulgare** L. Sp. pl. (1753) 583; M. B. Fl. taur.-cauc. II, 54; Benth. Lab. gen. et sp. 591 et in DC. Prodr. XII, 453; Ldb. Fl. Ross. III, 406; Boiss. Fl. or. IV, 703; Shmal'g. Fl. II, 331; N. Pop. in Protok. Obshch. estestv. Yur'evsk. univ. XXIII, 4, 141. — *M. apulum* Ten. Fl. Nap. atlas, IV (1811–1838) 34, tab. 154. — *M. hamatum* Humb. et Kunth, Nov. gen. et sp. II (1817) 250. — *M. anisodon* C. Koch in Linnaea, XXI (1848) 696; Trautv. in Tr. Bot. sada, IX, 103. — *M. vulgare* var. *lanatum* Benth. in DC. Prodr. XII (1848) 453. — *M. vulgare* var. *arcuata* Trautv. op. cit. V (1874) 471. — *M. v. var. macrocalyx* N. Pop., op. cit. 141; Grossg. Fl. Kavk. III, 288. — *M. kusnezovii* N. Pop., op. cit. (1916) 145. — **lc.**: Fedch. and Fl. Fl. Evrop. Ross. 605, Figure 714. — **Exs.**: Fl. morav. No. 261, Fl. Palest. No. 175.

236 Perennial, 30–60 cm high, whitish-lanate; stems simple or branching, covered with long appressed hairs; basal and cauline leaves orbicular-ovate, coarsely crenate-dentate; the terminal similar but smaller, rugose, pale green with scattered long hairs above, grayish beneath with long bristly hairs, prominently veined, short-petioled; lower verticillasters very distant, the upper approximate; bracts subulate, recurved, densely covered with long hairs, shorter than or equaling calyx-tube; calyx with 10 divergent subulate hamate teeth, of these 5 longer, 1/3 to 1/2 as long as the long-hairy tube; corolla white; the upper lip as long as or slightly shorter than the lower, 2-cleft at apex, the lower lip with broadly reniform middle lobe and small lateral lobes; nutlets oblong-ellipsoid, spotted, finely tuberculate. June–August.

Roadsides, cultivated fields, wastelands. — European part: Balt., U. Dnp., M. Dnp., Bl., Crim., L. Don; Caucasus: Cisc., E. and S. Transc., Tal.; Centr. Asia: Ar.-Casp., Balkh., Kyz. K., Mtn. Turkm., Amu D., Syr D. **Gen. distr.**: Centr. Eur., Med., Bal.-As. Min., Iran, Ind.-Him., Dzu.-Kash. Described from N. Europe. Type in London.

Note. We do not attach much taxonomic significance to the forms of this polymorphous species, described by various authorities as varieties or even as independent species (mainly based on the character of vesture or the curvature of calyx-teeth) because they are not associated with definite geographical areas.

Economic importance. Known as a medicinal plant. At one time it was used in W. Europe as a remedy for chronic ailments of the respiratory tracts (the medicament was produced in Russia). Horehound has also been advocated as a substitute for cinchona bark, but pharmacological tests have not so far yielded positive results.

The aerial parts contain a crystalline bitter principle and amorphous bitter principles of unknown composition.

A good nectariferous plant, producing a large amount of nectar.

2. **M. alternidens** Rech. fil. in Oesterr. Bot. Zeitschr. (1952) 37. — *M. vulgaris* var. *oligodon* Rech. fil. ap. Köie, Dan. Scient. Invest. in Iran 4 (1945) 44.

239 Perennial, 30–100 cm high, erect, branching in upper part, coarse, flocculent-hairy in lower half, lanate above; lower leaves elliptic or orbicular, to 5 cm long and 4 cm wide, coarsely crenate, erose-crenate at apex; upper cauline and floral leaves resembling the lower but smaller, pale green, rugulose, velutinous above, gray beneath, densely covered with appressed fascicled and bristly hairs; basal and cauline leaves with petioles 3–6 mm long, the upper short-petioled; inflorescence long, of 12–15 many-flowered verticillasters, these very distant in lower part, only the uppermost 2 or 3 approximate; bracts subulate-setaceous, as long as or slightly longer than calyx, the lower bracts partly declined, **partly**

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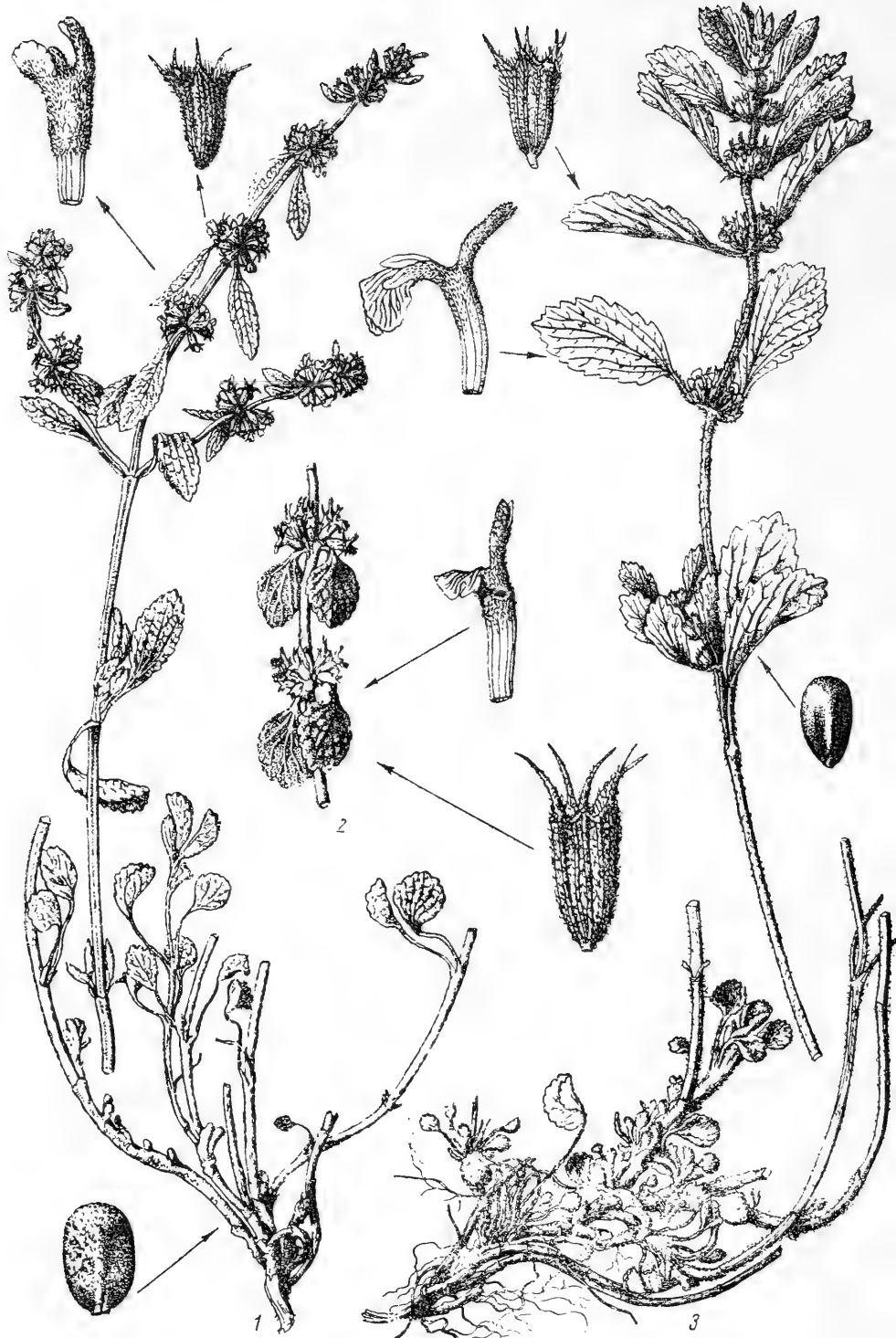


PLATE XV. 1 — *Marrubium parviflorum* Fisch. et Mey., general aspect, calyx, corolla, seed; 2 — *M. persicum* C. A. M., fragment of inflorescence, calyx, corolla; 3 — *M. goktschaicum* N. Pop., general aspect, calyx, corolla, seed.

appressed to calyx, covered with fine cellular and fascicled hairs; calyx with 10 unequal teeth, 5 longer teeth alternating with 5 shorter ones, patent, slightly arched-recurved or straight, with a ring of long hairs at throat at base of teeth, covered outside with simple and fascicled hairs; corolla pale yellow or pale pink, half as long again as calyx, the upper lip incised-notched, the broadly linear lobes rounded at apex, the lower lip with broadly reniform undulate-margined middle lobe and oblong round-tipped lateral lobes, the tube narrow at base, cupuliformly dilated above; nutlets dark brown, obovoid, obtusely 3-angled, smooth, blackish.

Dry places, wormwood-grass and grass-mixed herbs steppe, often a weed. — Caucasus: E. Transc. (Gogenaker, reported by Rechinger); Centr. Asia: T. Sh. (W.), Pam.-Al., Mtn. Turkm. (Kopet-Dagh). **Gen. distr.:** Bal.-As. Min. (Anatolia), Iran., Ind.-Him. Described from Shakhrud-Bustam province in Iran. Type in Vienna.

Note. The species is highly variable in the vesture of stem and leaves as well as in the shape of leaves.

3. **M. woronowii** N. Pop. in Protok. Obshch. estestv. Yur'evsk. univ. XXIII, 4 (1916) 146; Grossg. Fl. Kavk. III, 287. — **lc.:** N. Pop., op. cit. 117, Plate 4.

Perennial, 20–40 cm high; stems ascending, reddish; lower leaves semiorbicular, crenate in upper part; bracts oblong, rounded at apex, tapering at base, twice as long as verticillasters; outer bracts slightly shorter than calyx, rigid, subulate-spinescent; calyx with 10 erect, subulate teeth, half as long as tube, the tube covered with stellate and simple hairs; corolla purple, exserted. April.

Shrubs, in central mountain belt. — Caucasus: S. Transc. (western part). Endemic. Described from former Artvin district. Type probably in Tbilisi.

4. **M. praecox** Janka in Oesterr. Bot. Zeitschr. XII (1875) 62; Boiss. Fl. or. IV, 702; Shmal'g. Fl. 331; N. Pop. in Protok. Obshch. estestv. Yur'evsk. univ. XXIII, 148; Grossg. 240 Fl. Kavk. III, 288. — **M. pannonicum** Rchb. Fl. Germ. exc. (1833) 325; Benth. in DC. Prodr. XII, 452. — **M. paniculatum** Desr. in Lam. Encycl. III (1789) 716. — **M. pestalozzae** Boiss. Diagn. Ser. II, 4 (1859) 54. — **lc.:** Rchb. Pl. crit. III, 86, tab. 300. — Exs.: GRF, No. 835.

Perennial, 30–60 cm high, gray appressed-tomentose; stems covered with short fascicled hairs; branches directed upward; leaves oblong-ovate or oblong, entire at base, crenate-serrate in upper part, netted-rugose above, covered with monoradiant stellate hairs (i.e. with 1 elongate ray) and simple hairs, deeply netted-rugose beneath, prominently veined, more densely covered with closely appressed stellate (partly with elongate rays) and simple hairs, short-petioled; terminal (floral) leaves oblong-lanceolate, longer than verticillasters; inflorescence with many verticillasters, these 8–10-flowered, very distant in lower part, approximate above; bracts subulate, equaling or slightly shorter than calyx-tube, covered with stellate hairs with 1 elongate ray and bristly hairs; calyx 5–10-toothed, the teeth erect, unequal, lanceolate-subulate, rigid, acuminate, 1/3–1/2 as long as tube, the tube cylindrical, prominently nerved, densely covered with stellate hairs, some of these markedly monoradiant; corolla white, nearly twice as long as calyx, the tube with stellate and sparse simple hairs outside under throat, glabrous in lower half, the upper lip deeply cut into two lobes, the lower lip with reniform middle lobe and oblong-ovate lateral lobes; nutlets ovoid, finely tuberculate. June–August.

Steppes, fields. — European part: M. Dnp., V.-Don, Bes., Bl., Crim., L. Don, L. V.; Caucasus: Cisc., Dag., E. Transc. **Gen. distr.:** Centr. Eur., Bal.-As. Min. Described from Austria. Type in Vienna.

5. **M. parviflorum** Fisch. et Mey. Ind. sem. hort. Petrop. II (1835) 33; Boiss. Fl. or. IV, 704; N. Pop. Protok. Obshch. estestv. Yur'evsk. univ. XXIII, 4, 146; Grossg. Fl. Kavk. III, 288. — **M. peregrinum** C.A.M. Verz. (1831) 28, non L. — **M. radiatum** Benth. in DC. Prodr. XII (1848) 452, non Delil.; Ldb. Fl. Ross. III, 405.

241 Perennial, 40–60 cm high; stems 1–4, erect, branching above, whitish-grayish, densely covered with fine long branching stellate hairs, these with unequal rays; radical leaves many, white-tomentose, elliptic or orbicular; cauline leaves oblong, tapering at base, finely toothed, green above, with bristly and long hairs (mainly on the convex sections, i.e. between nerves), covered beneath with long, flexuous and fascicled hairs and sparse monoradiant stellate hairs, petiolate; floral leaves similar to the cauline but smaller, subsessile, exceeding verticillasters; inflorescence long, lower verticillasters very distant, 8–10-flowered, the upper approximate; bracts curved, $1/3$ – $1/2$ as long as calyx, covered with flexuous and fascicled hairs; calyx prominently nerved, the tube 4.5–5.5 mm long; 5 or 10 irregular, 2–2.5 mm long, teeth densely covered with unequiradiant or monoradiant stellate hairs (glandular hairs sometimes occur); corolla whitish-yellowish, the tube scarcely exerted from calyx, the upper lip short-notched, with 2 oval lobes, the lower lip with broadly elliptic undulate-margined or denticulate middle lobe, the elliptic lateral lobes as long as middle lobe. May–July. (Plate XV, Figure 1.)

Lower and middle mountain belt, dry places. — Caucasus: E. and S. Transc., Tal. **Gen. distr.:** As. Min., Iran. Described from Talysh. Type in Leningrad.

Subsection 2. *Quinquedentata* Briq. in Pflanzenfam. IV, 3a (1897) 230. — Calyx-teeth 5, very rarely 6–7 and then auxiliary (commissural) teeth small.

Group 1. *Stellata* Briq. l. c. — Calyx-teeth stellate-declined.

6. **M. plumosum** C.A.M. Verz. (1831) 96; Benth. Lab. gen. et sp. (1834) 589; id. in DC. Prodr. XII, 448; Ldb. Fl. Ross. III, 403; N. Pop. in Protok. Obshch. estestv. Yur'evsk. univ. XXIII, 4, 157; Grossg. Fl. Kavk. III, 290. — **M. leonuroides** Desr. var. *plumosum* Boiss. Fl. or. IV (1872) 701; Shmal'g. Fl. II, 331.

242 Perennial, 28–35 cm high; stems slightly curved, branching, covered with long hairs; lower leaves reniform, coarsely crenate, with petioles of medium length; upper leaves orbicular, short-petioled or sessile, grayish-green rugose above, sparsely covered with monoradiant stellate hairs, gray beneath with copious tightly appressed stellate hairs and prominent veins; verticillasters 4–6-flowered; bracts nearly as long as calyx, subulate-setaceous, densely covered with simple and monoradiant stellate hairs; calyx-teeth 5, patent, subulate-acicular, as long as tube, covered up to the naked point with multijointed and fascicled hairs; corolla pale pink, slightly exerted from calyx, the upper lip as long as the lower, cut to at least half its length into narrowly oblong lobes; the lower lip with

broadly flabelliform middle lobe and oblong lateral lobes; nutlets oblong, obtusely 3-angled, brown, glabrous. June.

Alpine mountain belt, taluses. — Caucasus: Dag. Endemic. Described from alpine belt of E. Caucasus. Type in Leningrad.

7. *M. catariifolium* Desr. in Lam. Encycl. III (1789) 717; Benth. in DC. Prodr. XII, 449; M. B. Fl. taur.-cauc. II, 53; Ldb. Fl. Ross. III, 403; Boiss. Fl. or. IV, 699; N. Pop. in Protok. Obshch. estestv. Yur'evsk. univ. XXIII, 4, 155; Grossg. Fl. Kavk. III, 289. — *M. candidissimum* C. A. M. sec. Boiss. l. c. non L. — *M. catariaefolium* Desr. var. *microphyllum* Somm. et Lev. in Tr. Bot. sada, XVI (1900) 392. — Exs.: Pl. or. exs. No. 121.

Annual, 15–45 cm high; stems divaricately branching nearly from base, stellate-hairy, the hairs partly short, partly monoradiant (with 1 elongate ray); leaves thin, the basal and cauline ovate-oblong, coarsely crenate, pale green above, subglabrous or with sparse simple and stellate hairs with 1 elongate ray, covered beneath with copious short-rayed stellate and sparse fascicled hairs; lower leaves with petioles 10–20 mm long; upper leaves short-petioled; floral leaves resembling the cauline but smaller; flowers in 6–9 verticillasters, these very distant, only the uppermost 2 or 3 approximate; bracts as long as calyx, subulate, spinescent, rigid, partly recurved, partly spreading, covered with monoradiant stellate and fascicled hairs; calyx half as long as tube, appressed-hairy, covered with monoradiant and fascicled hairs, with 5 short, lanceolate-subulate, patent teeth; corolla pink or white, the tube markedly exserted from calyx, the upper lip as long as the lower, cut into two oblong lobes, the lower lip with broadly infundibuliform middle lobe and oblong lateral lobes; nutlets ellipsoid, dark brown, finely tuberculate. June–August.

Dry slopes, scrub; a weed among crops. — Caucasus: Cisc., S. and E. Transc. **Gen. distr.:** As. Min. Described from Syria. Type in Paris.

8. *M. leonuroides* Desr. in Lam. Encycl. III (1789) 715; Benth. Lab. gen. et sp. 588 et in DC. Prodr. XII, 450; Ldb. Fl. Ross. III, 404; Boiss. Fl. or. IV, 701; Shmal'g. Fl. II, 331; Briq. in Pflanzenfam. IV, 3a, 331; N. Pop. in Protok. Obshch. estestv. Yur'evsk. univ. XXIII, 4, 151; Grossg. Fl. Kavk. III, 289. — *M. astracanicum* M. B. Fl. taur.-cauc. II (1808) 52; Stev. in Mém. Soc. Nat. Mosc. III, 266, non Jacq. — **Ic.:** Rchb. Pl. crit. III, tab. 299.

Perennial, 60–65 cm high; stems coarse, slightly curved, branching, covered with short stellate and simple hairs; lower leaves ovate, coarsely incised-crenate; upper leaves oblong, covered above with stellate and 1-rayed stellate hairs, beneath along veins with simple hairs, densely covered between the veins with short, 5–6-rayed stellate hairs; lower leaves with longer petioles, the upper short-petioled; floral leaves exceeding verticillasters, these many-flowered and forming a long inflorescence; lower leaves remote, the upper approximate; bracts not spinescent, shorter than calyx, the outer divergent, the inner appressed to calyx, covered with long simple fine flexuous hairs; calyx 1/3–1/2 as long as tube, covered with appressed stellate fascicled and sparse multicellular hairs; teeth 5, subulate, acuminate, glabrous, short, patent and curved; corolla pink, the tube slightly exserted from calyx, glabrous at base, hairy above, the upper lip cut to middle into 2 lobes, much longer than the lower lip, this with broadly reniform middle lobe and oblong lateral lobes; nutlets elliptic, brown. May–July.

Dry slopes and weed-infested places from lower to upper mountain belt. — European part: Crim. (eastern part); Caucasus: Cisc., Dag. **Gen. distr.:** As. Min. Described from As. Min. Type in Paris.

9. **M. nanum** Knorr. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 346, fig. p. 347.

Perennial, 9–25 cm high; stems single, not branching, densely leafy, covered with fine tangled hairs; lower and median cauline leaves obovate, 1.5–2 cm long, 1.1–1.6 cm wide, dentate; the petioles 8–10 mm long; floral leaves resembling the cauline but smaller, green, sparsely covered with bristly hairs above, with long coarse bristly hairs on the veins beneath, verticillasters 5 or 6, subapproximate, 8–10-flowered; bracts subulate, equaling calyx-tube, ca. 4 mm long, covered with long fine hairs; calyx covered with short bristles and long hairs only along the prominent nerves, long-hairy inside at base of throat, the 5 triangular subulate teeth $2/5-1/2$ as long as tube, their points glabrous; corolla pale pink, exerted from calyx, the upper lip as long as the lower, shallowly notched, the lower lip
244 with broadly orbicular middle lobe and shorter oblong lateral lobes; nutlets ellipsoid, brown, obtusely 3-angled. May.

Caucasus: S. Transc. Endemic. Described from Nakhichevan ASSR. Type in Leningrad.

10. **M. propinquum** Fisch. et Mey. Ind. sem. hort. Petrop. I (1835) 33; Benth. Lab. gen. et sp. 743 et in DC. Prodr. XII, 450; Ldb. Fl. Ross. III, 404; Boiss. Fl. or. IV, 701; N. Pop. in Protok. Obshch. estestv. Yur'evsk. univ. XXIII, 154; Grossg. Fl. Kavk. III, 289. — *M. coerulescens* Desf. Cat. Horti reg. Paris. ed. 3 (1829) 395; Benth. in DC. Prodr. XII, 449.

Perennial, 30–45 cm high; stems coarse, curved, divaricately branching above, covered with long tangled hairs; lower cauline leaves ovate, the middle and upper obovate, cuneately tapering toward base, dark green, rugose above, with scattered short fascicled hairs, grayish-green beneath, the prominent veins densely covered with same as well as glandular hairs, petioles 8–10 mm long; floral leaves elliptic-cuneate, subsessile; verticillasters remote, many-flowered, approximate only at summit of inflorescence; bracts slightly curved, partly recurved, slightly shorter than calyx; calyx prominently nerved, covered with multicellular and glandular hairs, inside with profuse multicellular hairs below throat, the 5 patent subulate point-tipped teeth $2/3$ as long as tube; corolla pink, the tube exerted from calyx, the upper lip 2-lobed, the lower with broadly elliptic middle lobe and oblong lateral ones. June–July.

Dry slopes in mountain regions. — Caucasus: Tal. **Gen. distr.:** Iran. Described from Talysh. Type in Leningrad.

Note. Both Popov and Grossgeim attributed glabrous bracts to this species, but in fact they are always rather densely covered with multicellular hairs.

11. **M. persicum** C. A. M. Verz. (1831) 95; Benth. in DC. Prodr. XII, 449; Ldb. Fl. Ross. III, 404; Boiss. Fl. or. IV, 700; Briq. in Pflanzenfam. IV, 3, 230; N. Pop. in Protok. Obshch. estestv. Yur'evsk. univ. XXIII, 4, 190; Gross. Fl. Kavk. III, 289. — Exs.: Fl. or exs. No. 292.

Perennial, 35–45 cm high, niveous, densely tomentose-lanate with fine flexuous tangled

245 hairs; stems erect, branching; basal and cauline leaves orbicular, unevenly crenulate, grayish-green, rugose on both sides, sparsely covered with flexuous, tangled hairs; floral leaves elliptic, short-petioled or subsessile; inflorescence with 6–9 verticillasters, these 6–8-flowered, most distant, only the uppermost 2 or 3 approximate; bracts very small, subulate, twisted, 1/4–1/2 as long as calyx, covered with flexuous hairs; calyx-tube white-tomentose with shorter flexuous appressed hairs; calyx-teeth 5, subulate, spreading, rigid, spiny-tipped, 1/3–1/2 as long as tube; corolla lilac, not exerted from calyx, the upper lip slightly longer than the lower, shallowly notched into orbicular lobes, the lower lip with infundibuliform undulate-margined middle lobe and oblong lateral lobes. May–June. (Plate XV, Figure 2.)

Dry stony foothill slopes. — Caucasus: W., E. and S. Transc., Tal. **Gen. distr.:** Iran. Described from Talysh (Zuvant). Type in Leningrad.

Group 2. *Microdonta* Briq. in Pflanzenfam. 3a (1897) 230. — Calyx-teeth erect, 2/3–1/3 as long as tube.

12. **M. peregrinum** L. Sp. pl. (1753) 582; Benth. Lab. gen. et sp. 590 et in DC. Prodr. XII, 452; M. B. Fl. taur.-cauc. II, 53; Ldb. Fl. Ross. III, 409; Boiss. Fl. or. IV, 694; Shmal'g. Fl. 331; N. Pop. in Mat. fl. Kavk. III, 590. — *M. creticum* Mill. Gard. Dict. VIII (1768) No. 3. — *M. peregrinum* var. *creticum* C. Koch in Linnaea, XXI (1848) 696. — **lc.:** Rchb. Fl. Germ. tab. 23; Fl. Yugo-vost. VI, 161, Figure 683.

246 Perennial, 30–60 cm high, gray-tomentose; stems few; branches horizontally spreading, covered with short appressed and fascicled hairs, below inflorescence with stellate and fascicled hairs; basal and cauline leaves oblong-rhombic, entire at base, crenate-serrate above; terminal leaves smaller, lanceolate, brownish-green rugose above, covered with simple and monoradiant stellate or only with simple hairs, prominently veined beneath, with short fascicled hairs; inflorescence branching, with many subremote 8–10-flowered verticillasters; bracts as long as to equaling calyx-tube, subulate, thickish, gray, densely covered with fascicled and monoradiant stellate hairs; calyx campanulate, prominently nerved, densely covered with monoradiant stellate and fascicled hairs; teeth 5, strong, erect, triangular, becoming patent after flowering; corolla white, glabrous from base to middle, with stellate hairs above, the tube slightly exerted from calyx, the upper lip notched to middle into 2 oblong lobes, the lower lip slightly shorter than the upper, with broadly reniform middle lobe and oblong lateral lobes; nutlets triangular-ellipsoid, dark brown, finely tuberculate. June–July.

Dry steppe slopes. — European part: V.-Kama (along Taliev), Bl., Crim.; Caucasus: Cisc., according to Grossgeim in W. and E. Transc. **Gen. distr.:** Centr. Eur., Bal.-As. Min. Described from Centr. Eur. Type in London.

13. **M. goktschaicum** N. Pop. in Protok Obshch. estestv. Yur'evsk. univ. XXIII, 4 (1916) 160; Grossg. Fl. Kavk. III, 289.

Perennial; rhizome curved, with numerous slender rootlets; stems numerous, 20–40 cm high, curved, purple, covered with long fine hairs, more densely so at base and below inflorescence; lower leaves ovate, 2.5–3 cm long, 1.5–2 cm wide, with rather long

petioles, obtusely toothed; bracts ovate-elliptic, coarsely toothed, tapering at base, short-petioled or sessile, several times longer than verticillasters, pale green above with scattered simple hairs, rugose beneath, densely covered with stellate and simple hairs; verticillasters numerous, 10–12-flowered, distant in lower part of inflorescence, approximate above; bracts subulate, tough, spiny-tipped, straight, about equaling calyx, covered with very fine long white hairs and sparse stellate ones; calyx covered with simple fine long hairs and sparsely stellate-hairy; teeth 5, erect, subulate, $1/4$ – $1/3$ as long as tube; corolla lilac, long-exserted, the upper lip 2-cleft, the lower with broadly reniform undulate-margined middle lobe and oblong lateral lobes, the tube glabrous below middle, covered above, like limb of corolla, with stellate hairs; nutlets obovoid, dark brown, finely tuberculate. May–July. (Plate XV, Figure 3.)

Steppe mountain slopes. — Caucasus: S. and W. Transc., Tal. Endemic. Described from Sevan Lake in Armenia. Type in Leningrad.

14. *M. puppureum* Bge. in Mém. Acad. Sc. Pétersb. ser. VII, XXI, 1 (1873) 162; Grossg. Opred. rast. Kavk. 329. — ? *M. astracanicum* Jacq. Ic. rar. I (1781–1786) 11, tab. 109; N. Pop. in Protok. Obshch. estestv. Yur'evsk. univ. XXIII, 4, 160; Grossg. Fl. Kavk. III, 289. — *M. astracanicum* var. *raddeanum* Alb. Prodr. Fl. Colch. (1895) 201; N. Pop., op. cit. 162.

247 Perennial, 20–35 cm high; stems ascending at base, coarse, sparsely covered in lower part, more densely above (especially beneath inflorescence), with stellate hairs and stellate hairs with 1 long ray; lower leaves broadly ovate, suborbicular, coarsely crenate, with petioles 2–4 cm long; floral leaves oblong, cuneately tapering at base, toothed only at apex, twice as long as verticillasters, subsessile, grayish sericeous above with stellate (including monoradiant) hairs; inflorescence branching, the many-flowered verticillasters subremote, the terminal closely approximate; bracts subulate, point-tipped, nearly as long as tube, sometimes reaching calyx-teeth, covered with simple hairs; calyx covered with stellate (including monoradiant) hairs, the 5 short erect teeth $1/3$ – $1/2$ as long as tube; corolla purple, the upper lip slightly longer than the lower, deeply notched with 2 oblong lobes, the lower lip with infundibuliform middle lobe and oblong lateral lobes; nutlets elongate-ellipsoid, dark brown. June–July.

Stony places in southern and middle mountain belts. — Caucasus: S. Transc., Tal. Gen. distr.: Iran. Described from Iran. Type in Paris.

15. *M. turkeviczii* Knorr. sp. nov. in Addenda XIX, 352.

Perennial, 34–36 cm high, woody at base; stems few, slender, slightly curved, purple-brown, covered with fascicled and simple hairs; radical and cauline leaves ovate, with short rounded teeth toward apex; upper cauline leaves oblong, tapering at base; floral and upper cauline leaves 3–4 times as long as verticillasters, with petioles 20–30 mm long, pale green above, sparsely covered with bristly and monoradiant stellate hairs, gray beneath, densely covered with appressed monoradiant stellate hairs and long hairs; verticillasters 7–10-flowered, distant, the uppermost 2 or 3 approximate; bracts as long as calyx, covered with long hairs; calyx with somewhat prominent nerves, the 5 erect subulate point-tipped teeth covered with long hairs except for glabrous point, the tube covered with stellate (including monoradiant) hairs; corolla lilac, the tube exserted from calyx,

glabrous at base, with stellate hairs near throat, the upper lip longer than the lower, deeply notched with 2 oblong lobes, the lower lip with broadly infundibuliform oval middle lobe and oblong-oval lateral lobes; nutlets dark brown, ellipsoid, 3-angled, finely tuberculate. May.

248 Rocks. — Caucasus: S. Transc. **Gen. distr.:** E. Anatolia. Described from former Kars region, slopes near Araks River. Type in Leningrad.

Note. Although this plant was collected outside the USSR, we consider it necessary to report it in the "Flora of the USSR," because it was collected so close to the border.

Genus 1249.* **Lagopsis**** Bge.

Bge. ex Benth. Lab. gen. et sp. (1834) 586.

Calyx tubular or tubular-campanulate, 10-nerved, with 5 unequal teeth (2 longer than the others); corolla with long tube and 2-lipped limb, the upper lip erect, entire or shallowly notched at apex, the lower lip 3-lobed, patent, with broader middle lobe; stamens 4, the lower longer than the upper but not exserted from corolla-tube; anthers 2-celled, the cells divergent; style 2-lobed at apex, the lobes short, subovoid, obtuse; nutlets oblong or ovaloid, 3-angled, obtuse at apex, smooth or alveolate. Perennial herbs, with palmatisect or pedate leaves.

Four species distributed mainly in the Soviet Union but also occurring (2 species) in the Dzungaria-Kashgar area and in Mongolia.

1. Flowers in long loose spicate inflorescences, forming 16–20 distant or partly approximate whorls; corolla white or pale pink. 4. **L. supina** (Steph.) Ik.-Gal.
- + Flowers in short dense spicate inflorescences; corolla cinnamon brown or yellow 2.
2. Corolla cinnamon brown; leaves reniform-orbicular 3.
- + Corolla yellow; leaves cordate or broadly ovate 2. **L. flava** Kar. et Kir.
3. Bracts as long as calyx; leaves green on both sides, subglabrous 3. **L. eriostachya** (Benth.) Ik.-Gal.
- + Bracts 1/3–1/2 as long as calyx; leaves white-lanate on both sides 1. **L. marrubiastrum** (Steph.) Ik.-Gal.

1. **L. marrubiastrum** (Steph.) Ik.-Gal. from Kryl. Fl. Zap. Sib. IX (1937) 2303. — *Molucella marrubiastrum* Steph. in Mém. Soc. Nat. Mosc. (1809) 8, excl. ic.; Bge. in Ldb. Fl. Alt. II, 817. — *M. laniflora* Willd. ex Benth. in Linnaea, XI (1837) 339. — *Marrubium lanatum* Benth. Lab. gen. et sp. (1834) 587; id. in DC. Prodr. XII, 442; Ldb. Fl. Ross. III, 402. — *Lagopsis incana* Bge. Suppl. alt. (1836) 59. — **Ic.:** Ldb. Ic. pl. Fl. Ross. II, tab. 150.

Perennial, 5–20 cm high; stems ascending, spreading, covered sparsely at base, densely below inflorescence, with white-lanate flexuous pubescence; leaves orbicular-reniform,

* Treatment by O.E. Knorring.

** From the Greek *lagos*, hare and *opsis*, appearance, face.

shallowly palmatipartite with 5 ovate or suboblong lobes, these with obtuse or rounded teeth at apex, both sides white-lanate with fine tangled hairs; lower leaves with long pubescent petioles; uppermost leaves short-petioled, smaller, rhombic, mostly with 3 orbicular-ovate lobes; flowers in terminal, oblong, ovoid, densely villous, compact spicate inflorescences, only 1 or 2 lowermost verticillasters subdistant; bracts setaceous, 1/3-1/2 as long as calyx, densely covered with long fine hairs; calyx campanulate, densely covered all over with very long white hairs, the 5 triangular teeth acutely spinous-tipped; corolla cinnamon-brown, as long as or nearly as long as calyx, the upper lip entire, broadly ovate, distally hairy outside, the lower lip with 3 orbicular lobes; lower stamens twice as long as the upper; nutlets brown, ovaloid, tapering at base, subobtuse at apex, glabrous.

June-July.

Gravelly and stony places, in the desert-steppe belt and adjacent parts of the alpine mountain belt. — West Siberia: Alt. (Chu steppe, Kurai steppe, and others). Endemic. Described from Altai. Type in Leningrad.

2. **L. flava** Kar. et Kir. in Bull. Soc. Nat. Mosc. XV (1842) 425. — *Marrubium flavum* Walp. Repertorium, III (1844-1845) 856; Benth. in DC. Prodr. XII, 448; Ldb. Fl. Ross. III, 403.

Perennial, 14-27 cm high; stems few, coarse, 4-angled, sparsely or densely tomentose-lanate; leaves cordate, shallowly palmatipartite with 3-5 oval or ovate lobes, obtusely toothed at apex, glabrous above or hirsute, more densely so beneath; petioles of lower leaves 2-3.5 cm, the upper 1 cm long; flowers in terminal ovoid-ovaloid spikes; verticillasters crowded, only the lowermost 2 or 3 distant; bracts one-third as long to as long as calyx-tube, covered with long hairs; calyx tubular-campanulate, covered with long hairs, the 5 subulate-acicular teeth unequal but approximately as long as calyx-tube; corolla yellow, the longer upper lip oblong-elliptic, distally hairy outside, the lower lip with
250 broadly elliptic middle lobe and elliptic lateral lobes; nutlets ovoid, pale brown, alveolate. July-August. (Plate XVI, Figure 2.)

Gravelly places in alpine mountain belt. — Centr. Asia: Dzu.-Tarb., T. Sh. **Gen. distr.:** Dzu.-Tarb. Described from sources of Sarkan River (Dzungaria Ala-Tau). Type in Leningrad.

3. **L. eriostachya** (Benth.) Ik.-Gal. in herb. (1936). — *Marrubium eriostachyum* Benth. Lab. gen. et sp. (1834) 586; id. in DC. Prodr. XII, 448. — *Leonurus eriostachys* Turcz. mss. ex Benth. l. c. 586. — *L. eriophorus* Turcz. ex Steud. Nomencl. bot. II (1841) 25. — *Lagopsis viridis* Bge. Mon. gen. Molucc. ined. ex Benth. l. c. 586. — *Molucella mongholica* Turcz. ex Ldb. Fl. Ross. III, 402.

Perennial, 15-25 cm high; stems few, ascending, coarse, brown-purple, sparingly pubescent at base, densely so below inflorescence; leaves reniform-orbicular, deeply palmatifid, 5-lobed, with ovate or oval obtusish teeth, green on both sides, subglabrous or short-hairy on the veins beneath, the margins revolute, ciliate; lower and middle leaves with petioles 1-2 cm long, upper leaves broadly short-petioled; inflorescence spicate, oblong-ovoid, densely villous, only the lowermost 2 or 3 verticillasters distant; bracts subulate or acicular, rigid, nearly as long as calyx, covered with long hairs; calyx tubular-campanulate, completely covered with long hairs; calyx-teeth 5, triangular, unequal, subulately long-acuminate,



PLATE XVI. 1 — *Lagopsis supina* (Steph.) Ik.-Gal.; 2 — *L. flava* Kar. et Kir.

patent in flower; corolla cinnamon-brown, the upper lip about as long as the lower, broadly elliptic, long-hairy outside, the lower lip with broadly orbicular middle lobe and orbicular lateral lobes; nutlets ovaloid-oblong, rounded at apex. June-July.

East Siberia: Ang.-Say. **Gen. distr.:** Mong.? Described from East Siberia. Type in Leningrad.

4. **L. supina** (Steph.) Ik.-Gal. in herb. (1936). — *Leonurus supinus* Steph. ex Willd. Sp. pl. III (1800) 116. — *Marrubium incisum* Benth. Lab. gen. et sp. (1834) 586; id. in DC. Prodr. XII, 447; Ldb. Fl. Ross. III, 402; Kom. Fl. Man'chzh. III, 349. — *Krasch-nikowia* (sic) *geraniifolia* Turcz. ex Ldb. l. c. 402.

253 Perennial, 15-35 cm high; stems few, ascending from base, often branching, densely covered with short hairs; leaves deeply incised, 3-lobed, the lobes with rounded or oblong teeth, green on both sides, sparsely hirsute above, hairy only on the veins beneath, with ciliolate margins; lower leaves with petioles 15-20 cm long, the upper short-petioled; inflorescence long, spicate, composed of 16-20 verticillasters, these 8-12-flowered, mostly subremote, 3 or 4 closely approximate; bracts about equaling calyx, curved, acicular, densely hirsute; calyx broadly campanulate, densely hirsute, the 5 unequal triangular point-tipped teeth 1/3-1/2 as long as calyx; corolla pale pink or white, slightly exserted from calyx, the upper lip longer than the lower, apically villous-hairy on the outside, the lower lip 3-lobed, with broadly elliptic middle lobe and elliptic lateral lobes; nutlets oblong-ovoid, brown, scaly. July-August. (Plate XVI, Figure 1.)

Damp places on riverside terraces, roadsides. — East Siberia: Ang.-Say., Dau. **Gen. distr.:** Mong., Ch. and Jap. Described from East Siberia. Type probably in Berlin.

Genus 1250.* **Sideritis**** L.

L. Sp. pl. ed. 1 (1753) 574. — *Hesiodia* Moench, Meth. Pl. (1794) 391. — *Burgsdorffia* Moench, l. c. 392. — *Empedoclea* Rafin. Caratteri (1810) 78.

Calyx tubular-campanulate, 5-10-nerved, sometimes slightly 2-lipped, with 5 erect, generally spiny teeth; corolla with tube enclosed in calyx, with 2-lipped limb; upper lip erect, nearly flat, entire or emarginate-bifid; lower lip spreading, 3-cleft, the middle lobe larger than the lateral, notched; stamens 4, didynamous, not exserted, the upper very short, with divaricately 2-celled anthers, the lower longer, mostly with deformed or reduced anthers; style also enclosed in corolla-tube, bifid, the upper lobe short, truncate, the lower dilated, surrounding the upper at base; nutlets ovoid, smooth, obtuse or rounded at apex; flowers in 6- to many-flowered verticillasters, axillary or forming spicate inflorescences. Annual or perennial herbs or subshrubs, usually very hairy or tomentose, with entire or dentate leaves.

* Treatment by S.V. Yuzepchuk.

** From the Greek *sideros*, iron. The name was used for the plant in antiquity and also during the 16th century because of its presumed effectiveness in the treatment of wounds inflicted by various weapons.

Note. A Mediterranean genus containing many species. In the Soviet Union it is meagerly represented; most species occur in the Crimea.

- 254 1. Perennials (subshrubs) 2.
 + Annuals 8.
 2. Floral leaves mostly longer than wide, merely contiguous at margins or scarcely overlapping, rather small, up to 2 cm, usually not becoming yellow 3.
 + Floral leaves nearly as wide or wider than long, markedly overlapping at margins, the largest usually more than 2 cm, becoming more or less distinctly yellow at flowering 5.
 3. Floral leaves small, 0.5–1.3 cm long, 6–9 mm wide, narrowly triangular, firm, grayish-green, very hairy, differing very little from upper cauline leaves in consistency, color and indument 1. *S. taurica* Steph.
 + Floral leaves mostly somewhat larger, to 1.8 cm long, 1.6 cm wide, more or less markedly differing from upper cauline leaves in thinner consistency, color (green or yellowish-green) and sparser indument 4.
 4. Floral leaves thin, dark green; verticillasters remote 2. *S. chlorostegia* Juz.
 + Bracts coarse, turning yellowish; verticillasters mostly approximate (especially in upper part of inflorescence) 4. *S. marschalliana* Juz.
 5. Verticillasters remote. Plants of Crimean highland pastures (and partly of southern coast of the Crimea) 3. *S. catillaris* Juz.
 + Verticillasters generally closely approximate. Plants of E. Crimea and W. Transcaucasus 6.
 6. Plants of E. Crimea; floral leaves markedly yellowing, rather sparingly pubescent; flowers also rather sparingly pubescent; calyx eglandular 7.
 + W. Transcaucasian plant; floral leaves grayish-green or faintly yellowing; floral leaves and flowers copiously hairy; calyx often with glandular hairs 7. *S. euxina* Juz.
 7. Stems mostly simple, usually bearing 1 terminal inflorescence; verticillasters relatively few (2–9, rarely up to 12), the lowermost often remote 6. *S. conferta* Juz.
 + Stems often (though not always) branching, with well developed lateral inflorescences in addition to terminal inflorescence; verticillasters (5) 8–15, all more or less closely approximate 5. *S. imbrex* Juz.
 255 8. Flowers yellowish-brown, subsessile; verticillasters more or less distant; at least lower internodes of inflorescence equaling calyx 9.
 + Flowers purple, distinctly pediceled; verticillasters closely approximate; internodes of inflorescence shorter than calyx 10. *S. balansae* Boiss.
 9. All floral leaves herbaceous, green; calyx-tube cylindrical, finally with constriction in upper part, the teeth often patent but straight 8. *S. montana* L.
 + Upper floral leaves scarious, yellow, forming a kind of coma at the summit of inflorescence; calyx-tube obconical, without distinct constriction, the teeth suberect-patent and mostly arched-recurved 9. *S. comosa* (Rochel) Stank.

Section 1. **Empedoclea** (Rafin. pro gen.) Benth. Lab. gen et sp. (1834) 571. — Perennial herbs; stems commonly woody at base, i.e. suffrutescent. Bracts unlike cauline leaves

at least in shape, usually also in consistency and vesture, mostly broadly cordate, subentire, acuminate, covering sessile flowers in verticillasters forming a spikelike inflorescence; calyx with 5 equal, acutely spinescent teeth.

Note. The species of this section are confined in their distribution to the east Mediterranean area. Apparently all members of the section occurring in the USSR belong to one natural series that may be designated as *Tauricae* Juz.; it would evidently include some of the Balkan-Asia Minor forms. Until recently, all Soviet components of this series were recognized as species, *S. taurica* "M.B."; this, however, has proved to be an aggregate species, providing an excellent example of an ancient Crimean-Novorossiisk endemic form, with distinct Asia Minor connections, which segregated into several narrowly localized, concrete (elementary) species. Six of these are known in the Crimea, the seventh growing in the vicinity of Novorossiisk.

256 It should be emphasized that determination of these species with the aid of a key does not always produce satisfactory results. Bornmüller rightly pointed out that in the section *Empedoclea* of the genus *Sideritis*, as in many of the other genera of *Labiatae* of the Eastern flora (*Nepeta*, *Marrubium*, *Salvia*, *Scutellaria*, *Stachys*, not to mention *Thymus*), it is often very difficult to present the distinctive features of some of the forms in a brief description even though such forms would be acknowledged at a glance as species. It is even more difficult to draw up a key that would reflect the distinguishing characters in a clear-cut fashion. Frequently, only comparison with the original material ensures reliable determination, the primary consideration being, in Bornmüller's words, "only the plant as a whole" (*J. Bornmüller, Neue und kritische Sideritis-Arten (Sectio Empedoclea) der vorderasiatischen Flora. Magyar Bot. Lap XXXI, 1932, 128*). We may add that investigation of extensive material usually helps in the matter.

Economic importance. The Crimean species of this section are of value as a source of essential oil and as ornamentals. They are also used as a substitute for tea (especially the highland pasture forms — *S. chlorostegia* Juz., *S. catillaris* Juz.). Some of them (e.g. *S. conferta* Juz.) have been reported to contain valuable fixative resins.

1. *S. taurica* Steph. ex Willd. Sp. pl. ed. 4, III (1800) 66; M. B. Fl. taur.-cauc. II, 43, p. p.; Ldb. Fl. Ross. III, 401, p. p.; Stev. Verzeichn. 281, p. p.; Boiss. Fl. or. IV, 709, p. p.; Shmal'g. Fl. II, 330, p. p. — *S. syriaca* Pall. Tabl. phys. et topogr. taur. (1795) 53 et in Nova Acta Ac. Sc. Petrop. X (1797) 312, saltem p. p. non L. — *S. armeniaca* β. *steveniana* Bornm. in Mag. Bot. Lap. 31 (1932) 137. — *S. scythica* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIII (1950) 296, in footnote. — *S. steveni* Zefirov, Gubotsv. (*Labiatae*) Kryma (1951) 6 (rossice) s. str. — Ic.: ?M. B. Centur. plant. rar. Ross. merid. (1810) tab. 39.

Subshrub, with rather long branching woody caudex and brown multicipital root; flowering stems one to several, 20–40 cm long; annotinous shoots ascending, rosulate; whole plant very densely appressed-tomentose, gray or almost snow-white; radical leaves 1.5–8.5 cm long, 0.6–1.6 cm wide, oblong-spatulate, gradually tapering toward base, at margin obscurely crenulate or (if sparsely pubescent) sharply denticulate, obtuse to sub-acute, sparingly hairy, rugulose; petioles 1–2 cm long; cauline leaves (1) 2–7 cm long, oblong-obovate to lanceolate, short-petioled to sessile, acute; inflorescence elongate, slender, 7–22 cm long, containing (6) 9–16 (18) verticillasters, rather compact or in lower

(257)

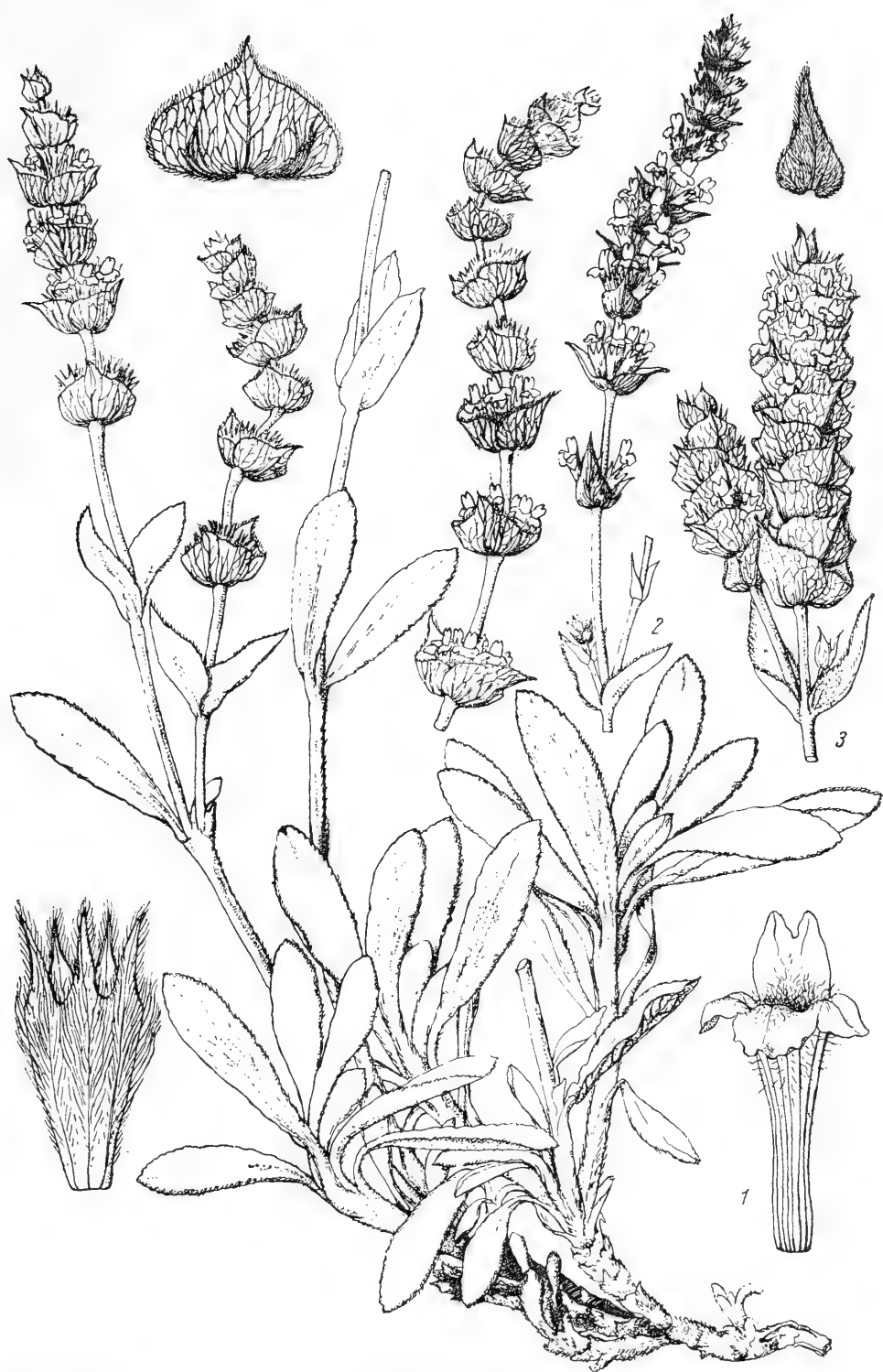


PLATE XVII. 1 — *Sideritis catillaris* Juz., general aspect and inflorescence, bract, calyx, corolla; 2 — *S. taurica* Steph. (*S. scythica* Juz.), inflorescence and bract; 3 — *S. imbrex* Juz., summit of stem with inflorescences.

259 part interrupted, with lower whorls 2-5 cm apart, the upper forming an uninterrupted spike; lateral branches, when present, 6-14 (18) cm long, bearing auxiliary inflorescences, these 3-8 cm long, distinctly pedunculate, resembling main inflorescence but much smaller; floral leaves small, 0.5-1.3 cm long, 6-9 mm wide, cordate or the lower mostly narrowly triangular, gradually (the uppermost often abruptly) acuminate, entire, firm, herbaceous, grayish-green, rather densely tomentose, usually broadly white-tomentose-rimmed at margin, with indistinct longitudinal nerves, the lowermost as long as or longer than calyx, the others mostly shorter (very rarely as long), successive pairs at most contiguous but never overlapping; calyx 6-8 mm long, loosely tomentose, the teeth lanceolate, erect, spinescent, keeled, about as long as calyx-tube, mostly fully protruding from under the floral leaves; corolla 8-10 mm long, at least half as long again as calyx, pale yellow, villous at throat, the tube completely enclosed in calyx (calyx-teeth slightly exceeding the corolla-tube), sparsely villous-tomentose outside in upper part; upper lip emarginate or shallowly bifid, with obtusish semiovate or subtriangular lobes; lower lip reflexed, tripartite; lateral lobes twisted, narrowly triangular, subobtuse, spreading, the lower lobe broad, rounded-tetragonal, slightly notched at apex, concave. June-September.

Limestone outcrops, taluses, stony steppe plots and slopes, pastures. — European part: Crim. (S. Crimea, western end, western part of foothills to Simferopol' inclusive). Endemic. Described from near Sevastopol' (Khersones). Type was in Berlin; isotypes (including chirotype of Stephan!) in Leningrad.

Note. The very extensive synonymy of this species indicates, among other things, that authors who have recognized more than one species of this section in the Crimea have failed to acknowledge the plant described above as the true *S. taurica*. This oversight is due to the fact that, in the Crimea, this plant is by no means the most widely distributed species of the section (it is much less common than *S. catillaris* Juz.). Another reason is that ever since the time of Reichenbach (1826) and well into the present, Bieberstein has been accepted as the author of *S. taurica*. According to him, it was an aggregate species, embracing at least three different forms (namely, *S. taurica*, *S. catillaris* Juz. and *S. marschalliana* Juz., among which Bieberstein especially set off the latter). In actual fact, the author of the name *S. taurica* is apparently Stephan and the author of the first description is Willdenow. In describing the species, Willdenow cites "*S. taurica* Stephan in litt." The description itself could hardly fit better the material on *S. taurica* from Stephan's herbarium, preserved in the herbarium of the Botanical Institute of the Academy of Sciences of the USSR and labeled "*legi in Chers. (oneso)taur.(ico).*" It is indeed curious that completely identical and unquestionably duplicate material is preserved in the same herbarium with the label "*Herb. Fischer. (Sideritis) taurica Steph. Spont. Tauria,*" the name of the species being in Fischer's handwriting. It is clear that Stephan distributed duplicates of his *S. taurica* and there is no doubt that Willdenow based his description on one of them.

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We should point out that, even though we have included our *S. scythica*, described from the vicinity of Simferopol', in the synonymy of *S. taurica* Steph., we are not fully convinced of the absolute identity of these forms. Both the Sevastopol' plant (i.e. typical *S. taurica* Steph.) and the undoubtedly identical *S. steveni* Zefir. established from the vicinity of Syuren' station, have closely approximate verticillasters, while in *S. scythica* they are exceptionally distant (Plate XVII, Figure 2). The material on *S. taurica* Steph.

from the western part of its distribution area is far from sufficient and it is therefore impossible to determine with certainty that the western and eastern forms differ consistently in these characters and warrant specific segregation.

2. **S. chlorostegia** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 24. — *S. taurica* auct. nonnull. fl. taur. p. p.

Perennial; root very long, woody, brown, caudex multicapital, producing 1 to few stems and several abbreviated rosulate sterile shoots (anotinous stems); radical leaves 2–7 cm long, 0.5–1.7 cm wide, oblong-spatulate, gradually tapering toward base, obtuse at apex, obscurely and finely crenulate, rather densely (or young leaves very densely) covered with subappressed or loose tomentum, gray or greenish or initially subniveous; petioles 1.5–4 cm long; flowering stems (21) 25–50 cm long, suberect, very densely subappressed-tomentose, subniveous; cauline leaves 2.5–8 cm long, 0.5–2 cm wide, oblong-obovate to lanceolate, short-petioled to sessile, obtusish to subacute, with tomentum rather like that on grown radical leaves, often greenish, rugose where tomentum less dense; uppermost cauline leaves 2–4.5 cm long, obtuse, mucronate or acute; inflorescence rather slender, (6) 9–22 cm long, interrupted in lower part, unbranched or very rarely with subfurcately branching stem; verticillasters (5) 8–15 (17), the lower always rather distant ((1) 2–4.5 (5.5) cm apart), the upper approximate to subremote; floral leaves medium-sized, 0.7–1.8 cm long, 0.6–1.6 cm wide, sessile, cordate, contiguous or mostly somewhat overlapping, the lowermost longer, the upper and uppermost shorter than verticillasters, abruptly and usually rather long-acuminate, submembranous, green, becoming brown in fruiting plants, loosely or very loosely tomentose, rather distinctly reticulate-nerved; calyx 7–9 mm long, loosely tomentose or subglabrous, the teeth lanceolate, straight, flexible, slightly patent at apex, lanate-villous, mostly exserted; corolla 10–11 mm long, half as long again as calyx, pale (sulfur) yellow, with tube enclosed in calyx, otherwise resembling corolla of *S. taurica* Steph. June–July.

Stony mountain slopes, rocky places (mainly limestone). — European part: Crim. (Baidar highland pasture and southern coast from Balaclava to Simeiz). Endemic. Described from Baidar highland pasture near Bizyuk survey point. Type and isotypes in Leningrad.

Note. This race occupies an intermediate position between *S. taurica* Steph. and *S. catillaris* Juz. Its differentiation, at least from the latter, does not appear to be quite definite. Certain forms that occur in Ai-Petri, which we have included in *S. catillaris* Juz., lean slightly toward *S. chlorostegia* Juz. One of them is a plant which was recorded in "Herbarium Florae Rossicae" as No. 73 (under the name *S. taurica* M. B.).

3. **S. catillaris** Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIII (1950) 296, in adnot. — *S. incana* Hb. Fiz. opis. Tav. obl. (1785) 148, ex descr. non L. — *S. taurica* M. B. Fl. taur.-cauc. II (1808) 43, p. p.; Ldb. Fl. Ross. III, 401, p. p.; Stev. Verzeichn. 281, p. p.; Boiss. Fl. or. IV, 709, p. p.; Shmal'g. Fl. II, 330, p. p. — Exs.: GRF, No. 73 (saltem huic proxima).

Subshrub, with woody base; root branching, producing ascending or prostrate brownish caudices, 1 or mostly several stems and also sterile rosettes (reduced anotinous stems); radical leaves 5–10 cm long, 0.7–2 cm wide, oblong-spatulate, gradually tapering to slightly

262 winged petiole 1–3 cm long, obtuse at apex, obscurely crenulate, very densely tomentose all over, snow-white or greenish-gray; stems 20–60 cm long, slightly ascending at base, otherwise erect, obscurely 4-angled, very densely appressed-tomentose, white or faintly greenish; cauline leaves subequal, 2.5–10 cm long, 0.7–2.1 cm wide, oblong-lanceolate to lanceolate, shortly winged-petiolate to sessile, the lowermost obtuse, others obtuse or acute, subniveous or grayish-green, often somewhat rugose where tomentum less dense; inflorescence (5) 8–23 cm long, rather thick, consisting of 5–11 (13) whorls, in lower part usually more or less interrupted, with internodes 1.2–4.2 (5.5) cm long, in upper part often spicate; lateral branches wanting or extremely few, with poorly developed inflorescences of second order; floral leaves medium-sized or the lower rather large, 1.2–2.2 (2.5) cm long, 1–2 cm wide, broadly cordate, strongly overlapping, at apex abruptly short-acuminate, as long as or (the upper) shorter than verticillasters, submembranous, yellowish-green, loosely tomentose or subglabrous, with a rather distinct but thin network of veins; calyx 0.8–1 cm long, greenish, with arachnoid-tomentose tube, the teeth as long as or slightly shorter than tube, lanceolate or narrowly lanceolate, erect, softish, at margin long-tomentose, obscurely keeled; corolla 1–1.2 cm long, up to 1½ times the length of calyx, pale yellow, softly subappressed-pubescent outside except for glabrous tube; upper lip erect, flat, deeply cleft, with oblong obtuse lobes; lower lip tripartite, reclinate, its lower part entire; nutlets ca. 2.5 mm long, flattened, short-ellipsoid or ovoid, 3-angled, blackish, dull. July–August. (Plate XVII, Figure 1.)

Rocks, stony places and slopes, mountain pastures. — European part: Crim. (highland pastures, sporadically adjacent part of southern coast). Endemic. Described from Roman-Kosh Mountain (Babugan-Yaila). Type in Leningrad.

Note. This species is the most widely distributed member of the section in the Crimea. It comprises an overwhelming majority of specimens preserved in Soviet herbaria under the name "*S. taurica*." It goes without saying that prior to our investigations, the *S. taurica* of those authors who tried to distinguish more than one perennial species of *Sideritis* in the Crimea (Bornmüller, Zefirov) corresponds first and foremost to *S. catillaris*.

We have not succeeded in elucidating the nature of *S. distans* Willd. (Sp. pl. III (1800) 66) which was described without indication of provenance. In Prodr. Fl. Balcan. (2 Bd., 1929, 258), Hayek adopted this name for "*S. taurica* M. B. which he included in the synonymy of *S. distans*. It has been recently demonstrated (P. H. Davis, Additamenta ad Floram Anatoliae, III. Notes fr. the Royal Bot. Gard. Edinburgh, Vol. XXI, No. 2, 1952, 69) that this was done without any justification since both *S. taurica* and *S. distans* had been published by Willdenow at the same time, the first actually having priority in listing. If the material on which *S. distans* was based originated from the 263 Crimea (which is very doubtful), then, according to the description, it would most likely correspond to *S. catillaris* Juz. This, however, is strongly contradicted by the acute leaves ascribed to *S. distans*.

4. *S. marschalliana* Juz. sp. nov. in Addenda XIX, 343. — *S. taurica* M. B. Fl. taur.-cauc. II (1808) 43, s. restr. (i. e. quoad pl. e Karassubasar) et auct. plus. fl. taur. p. p.; Ldb. Fl. Ross. III, 401, p. p.; Boiss. Fl. or. IV, 704, p. p.; Yuz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV, 28, non Steph. ex Willd. — ? *S. syriaca* Pall. Tabl. phys. et topogr. taur. (1795) 53 et in Nova Acta Ac. Sc. Petrop. X (1797) 312, p. p. — Ic.: ? M. B. Centur.

plant. rar. Ross. merid. (1810) tab. 39 (nisi potius *S. taurica vera* ?); Rechb. Ic. bot. IV (1826) tab. 384, fig. 563 (nom. *S. taurica* M.B.).

Subshrub, with robust woody root branching at the top and low caudex covered with brown bark and branching from base or summit; flowering stems 1 to (mostly) several, 25–45 cm long; in addition to stems there are also several abbreviated rosulate, annotinous shoots; the whole plant, the stems and young leaves in particular, very densely covered with appressed white tomentum, gray or (especially stems and young leaves) snow-white; radical and lower leaves 2–6 cm long, 0.5–1.2 cm wide, oblong-spatulate, gradually tapering toward base, obscurely crenulate or sometimes (in sparingly pubescent leaves) finely serrate-dentate, obtuse to subacute at apex, rugose when indument weakly developed; petioles 0.8–2 cm long; cauline leaves (1.2) 1.5–7.5 cm long, oblong-oblancheolate and (the upper) lanceolate, short-petioled or (the upper) sessile; lower leaves mostly subobtusely, the upper subacute to acute; inflorescence elongate-cylindrical, 5–20 cm long, with (7) 10–18 (22) verticillasters, rather slender or often fairly thick, somewhat interrupted in lower part, with lowest whorl mostly at a distance of 1–2.5 (3) cm from the others, tightly contracted above (sometimes throughout) in a dense uninterrupted spike; lateral branches wanting or fairly long, bearing mostly short contracted subsidiary inflorescences 4–6 cm long on peduncles ca. 7 cm long; floral leaves (except for lowermost which reach or often exceed base of the next pair) rather small or medium-sized, 0.6–1.8 cm long, 0.7–1.6 cm wide, cordate or broadly cordate, the lowermost more gradually, others abruptly attenuate to a rather long or (the upper) short firm spinous point, usually as long as or (in lower whorls) exceeding calyx, rather firm, chartaceous, grayish-green, later slightly yellowing, densely or sparingly tomentose, sometimes subglabrous, with narrow white-tomentose rim at margin, or sometimes scarcely rimmed, with more or less distinct longitudinal nerves and faintly discernible internerves, two of a pair contiguous at margins or rarely just overlapping in lowermost part; calyx 6.5–9 mm long, loosely tomentose; teeth lanceolate, erect, soft, with a distinct dorsal nerve, about equaling, or much shorter than, calyx-tube, strongly protruding from under the floral leaves; corolla 0.9–1.2 cm long, half as long again as calyx, pale (sulfur) yellow, villous at throat, the tube completely included in calyx, tomentose outside in upper part; upper lip erect, flat, deeply bifid, with oblong obtuse lobes; lower lip tripartite reflexed, the lateral lobes narrow, distant, the lower lobe dilated, entire, concave. July.

Chalk outcrops and taluses, chalky steppes. — European part: Crim. (Belogorsk district). Endemic. Described from Ak-Kai cliffs near Belogorsk (former Karasubazar). Type in Leningrad.

Note. In the Bieberstein herbarium there are tags bearing the inscription “*Sideritis taurica*. Ex Taurica” attached to 6 specimens of *Sideritis*. Two of them refer to the above-described plant, two are very similar but most likely represent the true *S. taurica* Steph., and two belong to *S. catillaris* Juz. of highland pastures. Bieberstein indicated Karasubazar as the location of *S. taurica* (“circa Karassubasar frequens”), which is the reason why we earlier accepted the above-described plant as *S. taurica*. This was of course a mistake based on a misunderstanding (at that time we ascribed the authorship of *S. taurica* to Bieberstein, as then generally accepted; see note to the latter species).

The extensive material that we collected at the classical location of *S. marschalliana* testifies to considerable variability of this species; it fluctuates in its characters between

S. taurica Steph. (which it approaches more closely) and *S. imbricata* Juz., and geographically occupies an intermediate position between them. We assumed its hybrid derivation (op. cit). As far as we know, neither the typical *S. taurica* nor *S. imbricata* now occurs in the vicinity of Belogorsk, and the Belogorsk form unquestionably deserves a specific name, all the more so because the possibility of its being acknowledged as a phylogenetically intermediate link between these two species cannot be ruled out.

5. *S. imbrex* Juz. nom nov. — *S. imbricata* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR. XIV (1951) 27, non H. Lindb. — *S. taurica* var. *orientalis* Zefirov, Gubotsv. Kryma (1951) 6 p. p.

265 A rather low subshrub, with woody root and woody branching caudex with ascending or decumbent brown ramifications; sterile shoots short, rosulate; fertile stems 1 to several, simple or very often slightly branching in upper part, 12–30 (35) cm long; radical leaves 2–6 cm long, 0.5–1.5 cm wide, oblong-spatulate, gradually tapering toward base, obtuse or very short-acuminate, nearly entire or obscurely crenulate; petioles 1–2 cm long; cauline leaves 1.5–6.5 cm long, oblong-oblongeolate or lanceolate, short-petioled or sessile, obtuse or the upper acute; all vegetative aerial parts very densely white-tomentose or old radical leaves (at base of fertile stems) and cauline leaves (especially the lower) usually less densely hairy, bright grayish-green, the least pubescent (green) leaves strongly rugulose; inflorescence 4–9 cm long, ellipsoid or short-cylindrical, rather dense, not interrupted, consisting of (5) 8–15 whorls, these very closely approximate or the lowermost whorl at a distance of 1–2 cm from others; lateral inflorescences wanting or very often branches borne in the axils of uppermost pair (very rarely 2 upper pairs) of cauline leaves developing lateral inflorescences, these closely approximate to and resembling the terminal inflorescence but somewhat shorter, 2–5 cm long; bracts imbricated, 0.8–2 cm long, 1–2.6 cm wide, sessile, cordate or broadly cordate, abruptly short-acuminate, the upper generally rounded at apex, with small mucro, entire or at times indistinctly incised-crenate; leaves of a pair broadly covering each other at margins; calyx 0.8–1.2 cm long, shallowly tomentose, the teeth slightly shorter than tube, erect, narrowly lanceolate, soft, with prominent dorsal nerve, protruding to not more than half their length from under bracts or often completely concealed; corolla 1–1.5 cm long, the tube included in calyx, the limb exserted, pale yellow (sulfur-yellow), the upper dilated part of tube rather densely covered with appressed long-sericeous hairs. July. (Plate XVII, Figure 3.)

European part: Crim. (eastern part). Endemic. Described from near Old Crimea (Agarmysh Mountain). Type in Leningrad.

Note. Stephan already noted (Verzeichn. 281) the occurrence of unique forms of “*S. taurica*” with large bracts and closely approximate “whorls.” He reported such a
266 form for Kerchi; however, not one specimen of “*S. taurica*” from that area is known to us though, generally speaking, similar forms grow apparently in eastern Crimea. We have differentiated the above-described form, *S. imbrex* Juz. growing near Old Crimea, and a form growing at the southern coast of eastern Crimea (see above) as separate taxonomic units (even though they are very closely allied).

6. *S. conferta* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 26. — *S. taurica* var. *orientalis* Zefirov, Gubotsv. (Labiatae) Kryma (1951) 6 (rossice) p. p.

Perennial, very similar to preceding species; stems 10–30 (36) cm high, usually simple; inflorescence slightly less dense, (2) 5–12 cm long, with (2) 5–9 (12) verticillasters, the lowermost 1 or 2 (3) often at a distance of up to 3 cm (though usually less) from the others; lateral inflorescences rarely present and then generally poorly developed; bracts of successive whorls not overlapping (the lower) or slightly overlapping, somewhat larger compared with *S. imbrex*, 1–2.6 cm long, 1.2–3 cm wide, gradually (the lower) or abruptly (the upper) tapering at apex to larger, often slightly curved, nearly spinous mucro, some with few remote or solitary fine obtuse or acute teeth at margin, two of a pair very broadly overlapping at margins; flowers slightly larger than in *S. imbrex*; calyx 8–12 mm long, the teeth often completely protruding from under the floral leaves; corolla 12–14 mm long; otherwise, similar to preceding species. June–July.

Stony mountain slopes, limestone outcrops. — European part: Crim. (E.). Endemic. Described from vicinity of Karadag and Sudak. Type and paratype in Leningrad.

Note. This and the preceding species are not always easily distinguished from each other. This is quite natural inasmuch as their extremely restricted distribution areas adjoin each other. However, the differences between them strike the eye when extensive material is examined.

7. *S. euxina* Juz. in Bot. mat. gerb. Bot. inst. AN SSSR, XIV (1951) 28, in footnote. — *S. taurica* Lipsky, Issledov. Severn. Kavk. (1889–1890) 33–34; idem, Fl. Kavk. 423; Shmal'g, Fl. II, 330, p. p. et auct. plur. fl. Cauc. non Steph. nec M. B. — *S. taurica* var. *glandulosa* Albov, Prodr. Fl. Colch. (1895) 202. — *S. steveni* Zefirov, Gubotsv. (Labiatae) Kryma (1951) 6 (rossice) p. p. (quoad pl. e distr. Novorossijsk). — Exs.: Fl. Cauc. exs. No. 145.

Subshrub, with woody root and branching caudex; stems usually numerous, sturdy, ascending at base, 18–50 cm long; sterile shoots abbreviated, rosulate; whole plant gray with dense appressed or (especially in mature leaves) slightly flocculent white tomentum; radical and lower cauline leaves 3–8 cm long, 0.5–1.5 cm wide, oblong-spatulate, gradually tapering toward base, mostly obscurely crenulate-serrulate, mostly subacute, rugose where sparingly pubescent; petioles 0.5–2 cm long; cauline leaves 2.5–7 cm long, oblong-oblan-
 267 ceolate to broadly lanceolate, short-petioled, the uppermost subsessile, acute, often non-duplicate and arched; inflorescence cylindrical, (4.5) 7–16 cm long, containing (5) 10–18 whorls, rather thick, in lower part slightly interrupted with lowermost whorl at a distance of 1.5–3 cm from others, contracted above often throughout in uninterrupted spike; lateral branches often present, short or fairly long, bearing well developed auxiliary inflorescences, these (3) 4–8 cm long, compact or below slightly interrupted, on peduncles 0.5–7 cm long; floral leaves 0.8–1.7 cm long, 1.2–2 cm wide, thin, chartaceous to submembranous, pale grayish-green or faintly yellowish, mostly densely or very densely tomentose, with prominent longitudinal and short transverse nerves, often obscurely crenate, broadly cordate, abruptly attenuate to a short (or lowermost to a long), slightly recurved point, usually equaling calyx, two of a pair usually widely overlapping at margins; calyx 11–12 mm long, heavily but loosely tomentose-villous all over, often with copious admixture of small short-stipitate glands; teeth erect, lanceolate, soft, with obscure dorsal nerve, about equaling or slightly shorter than tube, fully or mostly slightly protruding from under the floral leaves; corolla 14–15 mm long, small to half as long again as calyx, pale

yellow, densely villous at throat, the tube completely included in calyx, the upper part of the tube and nearly the whole limb densely sericeous-tomentose outside. June–August.

Stony dry sunny slopes, mountain steppes, limestone rocks. -- Caucasus: Cisc. (Anapa and others), W. Transc. (Novorossiisk region). Endemic. Described from near Novorossiisk. Type in Leningrad.

Note. N.A. Busch was mistaken in stating that "*S. taurica*" was first found in the Novorossiisk region by Lipskii. This statement appears on a tag attached to Duz's plant from near Novorossiisk distributed from the herbarium of the Yur'ev Botanical Garden.

- 268 In the herbarium of the Botanical Institute of the Academy of Sciences of the USSR there are specimens of *S. euxina* collected in Novorossiisk in 1841 (probably by Radozhitskii). The plant was also collected by Bayern. There is no question but that neither Bieberstein nor Boissier knew of the existence of *S. euxina*; hence Kolakovskii served no purpose in placing *S. taurica* M.B. p.p. and *S. taurica* Boiss. p.p. in the synonymy of *S. euxina* Juz. (Spisok rast. gerb. fl. SSSR, XII, 1953, 110).

Albow's "variety" was probably based on specimens with generally depauperate tomentum, in which the glandular vestiture of the calyx tends to be more conspicuous.

Section 2. **Hesiodia** (Moench, pro gen.) Benth. Lab. gen. et sp. (1834) 272. -- Annuals. Floral leaves resembling cauline leaves but smaller, entire or weakly crenate, obtuse; calyx 2-lipped, the 3 upper teeth connate at base.

Note. In contrast to the preceding, the species of this section are distributed throughout the Mediterranean region.

Series 1. *Montanae* Juz. -- Flowers bicolor, yellow with brown, on very short pedicels.

8. *S. montana* L. Sp. pl. (1753) 575; Ldb. Fl. Ross. III, 401, p.p.; Shmal'g. Fl. II, 330, saltem pro max. parte. -- *S. hirsuta* Eichw. Pl. nov. min. cogn. casp.-cauc. (1831–1833) 24, non L. -- ? *S. romana* Georgi, Besch. Russ. R. III, 5 (1800) 1081, non L. -- *Hesiodia bicolor* Moench, Meth. pl. (1794) 392. -- *H. montana* Dum. Fl. Belg. (1827) 44. -- *Burgsdorfia montana* Rehb. Fl. Germ. exc. (1830) 327. -- **lc.**: Rehb. lc. Fl. Germ. XVIII, 15 (1856) tab. 1226; Hegi, III. Fl. Bd. V, 4, fig. 3271 et 3272 (phot.). -- Exs.: Rehb. Fl. Germ. No. 1236; Schultz, Herb. norm. No. 2248; Woloszcz. Fl. pol. No. 980; Baenitz, Herb. Eur. (e Nagy Enyed a. 1894 sine No.); Fl. exs. Reip. Bohem.-Slov. No. 356.

- 271 Annual; root curved, flexuous; stems 10–50 cm long, erect or ascending at base, simple or slightly branching at middle, patent-tomentose-villous, with internodes 1–3 (5) cm long; leaves 1–4 (5) cm long, 0.25–1 (1.5) cm wide, spatulate or elliptic, obtuse to subacute or acuminate, short-petioled, the upper sessile, with 1–3 (5) longitudinal lateral nerves on each side produced into spiny-tipped teeth, otherwise entire, dull yellow on both sides, covered with long, mostly sparse hairs; flowers short-pedicel, in very numerous, mostly 6-flowered whorls, forming long, interrupted moderately dense spikes; bracts not or slightly differing from cauline leaves, mostly longer than flowers; summit of stems without bundle of bright green terminal leaves; calyx rigid, prominently nerved, slightly accrescent, 8–11 mm



PLATE XVIII. 1 — *Sideritis montana* L., general aspect, flower, corolla, fruiting calyx; 2 — *S. comosa* (Rochel) Stank., summit of stem, flower, corolla, fruiting calyx; 3 — *S. balansae* Boiss., general aspect, flower, fruiting calyx.

long in fruit, the tube subcylindrical or narrowly campanulate, with constriction in upper part, 10-nerved, loosely villous-hairy at throat; teeth ovate, villous, suberect to slightly patent, spiny-tipped, becoming fully spreading (but not curved), 3 connate into upper lip as long as tube; corolla shorter than calyx, pale yellow, the limb reddish-brown close to margin, becoming very dark brown (nearly black) after flowering and on drying; tube ca. 3 mm long, included in calyx; upper lip slightly convex, ca. 1.5 mm long; lower lip only ca. 1 mm long, with very small lateral lobes; stamens ca. 1.5 mm long, slightly hairy; nutlets 1.5 mm long, 3-angled, grayish-brown, rounded at apex and slightly foveolate-punctate, otherwise smooth. June–September. (Plate XVIII, Figure 1.)

Impoverished meadows, rocky places, steppes, wastelands, stony (often limestone) and sandy soil. — European part: U. Dnp., M. Dnp., V.-Don, Bes., Bl., L. Don, Crim. (mainly in northern part and foothills of mountainous Crimea); Caucasus: universal; Centr. Asia: Mtn. Turkm. (Kopet-Dagh). **Gen. distr.:** Med., Bal.-As. Min., Iran. Described from Italy. Type in London.

Economic importance. A noxious weed. There are reports that it is poisonous to horses.

9. *S. comosa* (Rochel) Stank. Opred. vysh. rast. Evrop. ch. SSSR (1949) 861. — *S. montana* β. *comosa* Rochel ex Benth. in DC. Prodr. XII (1848) 446; Boiss. Fl. or. IV, 707. — *S. montana* Ldb. Fl. Ross. I, 401 et auct. plur. fl. Ross. p. p. — Exs.: GRF, No. 525; Fiori et Bég. Fl. Ital. No. 1941.

Annual; stems 15–40 cm long, simple or often branching from base, covered with long spreading or erect-spreading hairs, often becoming intensely red; leaves 0.6–3.5 cm long, 0.1–0.6 cm wide, oblanceolate, gradually tapering to short petiole, the upper sessile, mostly acute, obscurely toothed, grayish-green on both sides, mostly densely covered with long spreading or loosely appressed hairs; floral leaves markedly shorter and slightly wider than cauline leaves, often only slightly exceeding flowers, the uppermost without flowers in their axils, usually enlarged, lemon-yellow or golden-yellow, forming a bundle or coma at summit of stem; flowers in very distant verticillasters; calyx 5–7 mm long, the tube dilated above, obconical or campanulate, nearly without constriction, the teeth lanceolate, suberect-patent and slightly recurved, shorter than tube; corolla small, but limb slightly larger than in *S. montana*, yellow with brown. Otherwise, similar to *S. montana* L. June–August. (Plate XVIII, Figure 2.)

Dry, mostly swardless slopes, stony places, steppes. — European part: Bes., Bl. (rarely), Crim. (mountainous part, very common); Caucasus: Cisc., W. and E. Transc. **Gen. distr.:** Med., Bal.-As. Min. Described from Dalmatia, Rumelia and Asia Minor. Type unknown.

Note. Up to recently *S. comosa* was considered as a form of little taxonomic importance. Boissier did not even list it as a variety. Gams regarded it (wrongly without doubt) as a seasonal fall modification (cp. Hegi, III, Fl. V, 4, 2405). However, our discovery of a number of other distinctive characters, besides the basic character of the yellow color of the bracts crowning the inflorescence, and a different geographical distribution area, led us to agree with Stankov, the first to promote this form to the rank of species. Our observations of *S. comosa*, mainly in the Crimea, gave us the impression of an aboriginal species widespread in the mountainous (southern) part of the peninsula. Conversely, *S. montana* appears to have penetrated into this area recently (from the north) and is far from being a synanthropic form. Intermediate forms between these two species often occur in the Crimea, but apparently only where they both grow together.

Series 2. *Balansaeanae* Juz. — Flowers purple (sometimes white), more or less distinctly pediceled.

10. *S. balansae* Boiss. Diagn. Ser. II, No. 4 (1859) 35; id. in Fl. or. IV, 707. — *S. woronowii* Schischk. ex Grossh. Fl. Kavk. III (1932) 290; Grossg. Oprod. rast. Kavk. 330. — *S. purpurea* auct. nonnull. fl. Cauc. non Talb.

A small annual, pale green, 2–15 cm high; stems erect or ascending at base, simple or branching from base with short and stout branchlets, sparsely covered with long spreading hairs, often suffused with red in lower part; leaves to 1.5 cm long, 0.8 cm wide, elliptic or oblong, obtuse, with few markedly asymmetrical acute teeth, sparsely or fairly densely hairy, rather long-petioled; inflorescence elongate, dense, the internodes shorter than calyx; floral leaves short-petioled, acute, otherwise resembling cauline leaves, as long as or barely exceeding flowers; verticillasters few or fairly numerous, 2–6-flowered; flowers
273 on distinct pedicels to 2–3 mm long; calyx 5–9 mm long, prominently nerved, patent-hairy, sometimes slightly reddening, the tube becoming dilated in lower part, constricted in upper part; calyx-teeth as long as or slightly shorter than tube, erect, ovate-lanceolate, abruptly attenuate to short mucro; corolla pinkish-purple (rarely white), almost included in calyx or slightly exserted; nutlets 1–1.5 mm long, grayish. May–July. (Plate XVIII, Figure 3.)

Dry stony slopes. — Caucasus: S. Transc. (Armenian SSR, Nakhichevan ASSR). **Gen. distr.:** Bal.-As. Min. (As. Min.). Described from Kilikia. Type in Geneva.

Note. We have been unable to distinguish the Transcaucasian plant of this type (i. e. *S. woronowii* Schischk. ex Grossh.) from the original *S. balansae* Boiss. Grossgeim, too, in his original description of *S. woronowii*, mentioned no differences between them.

S. balansae Boiss. is readily distinguishable from the Greek *S. purpurea* Talb., with which it was at times confused in the Soviet Union, by its low stem, short branches, scantier vestiture throughout, approximate verticillasters, more pronounced dentation of floral leaves (often discernible even in upper bracts), differently shaped calyx, with narrower teeth and weakly developed mucro, smaller corollas. The uppermost tooth of the calyx of *S. purpurea* is larger and wider than the three lower teeth, these narrow and acuminate. As regards this character, it should be included in another section — *Burgsdorfia* (Moench) Briq.

Tribe 2. *NEPETEAE* Benth. Lab. gen. et sp. (1834) 462; id. in DC. Prodr. XII, 368; Briq. in Pflanzenfam. IV, 3a (1895) 207 et 233. — Calyx 5-toothed or 2-lipped, the lips dentate; corolla with exserted tube and concave upper lip; stamens 4, didynamous, the upper longer than the lower, ascending parallel to each other and lying below upper lip; stamens and style not included in corolla-tube.

Genus 1251.* *Agastache*** Clayt. ex Gronov.

Gronov. Fl. Virgin. (1762) 88; O. Ktze. Rev. gen. II (1891) 511. — *Vleckia* Raf. in Med. Repor. New-York V (1808) 352. — *Lophanthus* sect. *Chiastandra* Benth. Lab. gen. et sp. (1834) 462.

* Treatment by A. I. Poyarkova.

** From the Greek *aga*, many, and *stachys*, spike.

Calyx 15-nerved, tubular-obconical, straight, the throat oblique, without hairy ring inside; corolla with erect tube, gradually and slightly dilated toward limb, equaling calyx or very slightly exserted, without hairy ring inside; upper lip erect, bifid; lower lip tripartite, the lateral lobes small, erect, and the middle lobe large, spreading, sessile (clawless), broad, crenate or undulate; all 4 stamens perfect, much longer than corolla, the upper curved forward, the lower upright; anther-cells at first nearly parallel, later slightly diverging; style with 2 short subequal lobes; disk regular, obscurely lobed; nutlets smooth, densely hairy at apex, attached by its basal part to the flat top of the disk at the gaps between its lobes and close to its center. Tall perennial herbs, with toothed petiolate leaves and small bisexual flowers; verticillasters forming terminal spikelike inflorescences.

One species in E. Asia and about 8 in North America.

1. **A. rugosa** (Fisch. et Mey.) O. Ktze. Rev. gen. II (1891) 511. — *Lophanthus rugosus* Fisch. et Mey. in Ind sem. hort Petrop. I (1835) 31; Benth. in DC. Prodr. XII, 369; Maxim. Prim. fl. Amur. 218; Kom. Fl. Man'chzh. III, 349; Kom. and Alis. Opred. rast. Dal'nevost. kraya, II, 899. — **lc.**: Kom. and Alis., op. cit. Plate 272.

Perennial; root robust, woody, oblique; stems to 1 mm [sic] long, to 7-8 mm thick, covered with very short appressed hairs, in upper part with leafy flowering branches; leaves thin (dry leaves chartaceous and more or less warped), to 8-9 (12) cm long and 5-7 (8) cm wide, ovate or oblong-ovate, with cordate or rarely rounded base, acuminate or terminating in a long attenuate point, coarsely toothed, with very short appressed hairs on both sides and numerous punctate glands beneath; petioles $1/4$ - $2/5$ as long as blade; verticillasters crowded at end of stem and of axillary branches in dense cylindrical inflorescences, these reaching 10 cm in length and 2 cm in width on the stem; terminal leaves at base of inflorescence similar to cauline leaves but smaller; floral leaves subtending the semiwhorls up to 5 mm long and ca. 1-1.2 mm wide, lanceolate-linear, long-acuminate; bracts similar but approximately half as long; pedicels 1-2 mm long, all densely covered with short spreading hairs; calyx (5) 7-8 mm long, more or less suffused with lilac or purple-lilac, sparsely covered with short simple spreading hairs (longer only at margin of teeth) and beset with sparse capitate white glandular hairs, the throat distinctly oblique; teeth lanceolate, the upper ca. $1/2$ ($2/5$) as long as tube, the lower shorter; corolla (6.5) 8-9.5 (10) mm long, bluish-lilac, puberulent above, the tube scarcely longer than calyx; upper lip 1.25-1.5 mm long, cleft approximately to middle into ovate lobes; middle lobe of lower lip strongly dilated, ca. 2 mm long, 3-3.5 mm wide, slightly notched at apex, with slightly undulate margin, the lateral lobes triangular, 0.3-0.5 mm long, 1.3-1.5 mm wide; stamens exserted from corolla for 3-5 mm; nutlets dark brown, obovoid, ca. 1.5 mm long, 0.6-0.7 mm wide, 3-angled, with obtuse apex, beset like ribs with upright rufous hairs. Fl. July-August, fr. August-September. (Plate XIV, Figure 2.)

Rocks, rocky grass-covered slopes, often in shade of trees and shrubs, in small groups. — Far East: Uss. (southern part, in the north Bureinskii Range and near Khabarovsk). **Gen. distr.**: Jap. and Ch., Tib. (provinces in central and eastern China). Described from China. Type in Leningrad.

Economic importance. This species is worthy of investigation as a source of essential oil, since all plant parts have a strong, pleasant peppermint scent.

Genus 1252.* **Lophanthus**** Adans.

Adans. Fam. Pl. II (1763) 194, 572, p. p.; emend. Benth. in Bot. Reg. XV (1829) post tab. 1282; emend. Briq. in Pflanzenfam. IV, 3a (1897) 234; Levin in Tr. Bot. inst. AN SSSR, V (1940) 268. — *Vleckia* Rafin. Fl. Tellur. III (1808) 89, p. p. — Sect. *Psilonepeta* Benth. gen. *Nepeta* L. in DC. Prodr. XII (1848) 392.

Calyx tubular or tubular-campanulate, straight or slightly curved, 5-toothed, with straight or more or less oblique throat, rarely 2-lipped, 15-nerved, with hairy ring inside; corolla straight or curved; the tube exserted, dilated above, twisted; limb inverted, the upper (here the lower) lip 2-lobed, the lower (here the upper) lip 3-lobed, the large middle lobe broader than long; anther-cells nearly parallel or slightly diverging; pistil parted above into 2 thin lobes; nutlets oblong-ovaloid, slightly compressed, rounded on one side, on the other bilaterally tapering, smooth, brown. Perennial herbs; leaves oblong to broadly ovate, crenate-dentate or dentate; floral leaves usually small; stems above and inflorescence usually leafless; cymes in axils of upper leaves; bracts small, linear-lanceolate, rarely broadly lanceolate.

1. Leaves with very prominent veins beneath, mostly plicate-rugose, to 15 mm long 2.
- + Leaves different 3.
2. Plant gray-tomentose, sometimes nearly white, rarely more or less green; leaves crisp-crenate; calyx nearly 2-lipped; corolla 10–15 mm long; 2 stamens long-exserted 7. **L. subnivalis** Lipsky.
- 276 + Plant short-hairy, grayish; leaves large, nearly incised-dentate; calyx straight at throat; corolla 15–18 mm long; stamens not exserted or slightly so 8. **L. elegans** (Lipsky) Levin.
3. All stamens not or scarcely exserted; calyx-teeth triangular-lanceolate; middle peduncles 7–12 mm long; plant 30–35 cm high; leaves broadly ovate, cordate at base, 10–20 mm long; petioles 1–6 mm long 4. **L. tschimganicus** Lipsky.
- + Two stamens long-exserted and 2 scarcely or not exserted 4.
- ++ All stamens long-exserted (very rarely 2 included); petioles 5–20 mm long; middle peduncles 15–20 mm long; inflorescence usually leafless; floral leaves usually linear-lanceolate. 6.
4. Plant covered with rather long stiffish hairs or subglabrous; leaves cordate at base; calyx tubular-campanulate, usually much dilated above, 8–11 mm long, nearly oblique at throat, the teeth mostly broadly oval-lanceolate; corolla 13–20 mm long 3. **L. schrenkii** Levin.
- + Plant subglabrous or puberulent (rarely almost tomentose); leaves at base rounded, truncate, obtuse, rarely cordate; calyx 6–10 mm long, oblique at throat or nearly 2-lipped, the teeth triangular-lanceolate; corolla 10–15 mm long 5.
5. Calyx tubular, slightly dilated above, nearly 2-lipped, 6–8 mm long; corolla bluish-lilac; middle peduncles 3–7 mm long; leaves 10–25 mm long 2. **L. krylovii** Lipsky.

* Treatment by E.G. Levin.

** From the Greek *lophos*, comb, helmet, and *anthos*, flower.

- + Calyx nearly tubular-campanulate, mostly markedly broadening above, more or less oblique at throat, 6–10 mm long; corolla blue; middle peduncles 8–12 mm long; leaves 15–40 mm long 1. **L. chinensis** (Rafin.) Benth.
- 6. Calyx tubular-campanulate, the teeth oval-lanceolate or lanceolate 5. **L. schtschurowskianus** (Rgl.) Lipsky.
- + Calyx tubular, teeth narrowly lanceolate, rarely triangular-lanceolate, acute, often point-tipped 6. **L. lipskyanus** Ik.-Gal. et Nevski.

1. **L. chinensis** (Rafin.) Benth. in Bot. Reg. XV (1829) post. tab. 1282; id in DC. Prodr. XII, 369, p. p.; Ldb. Fl. Ross. III, 372, p. p.; Turcz. Fl. baic.-dahur. II, 401; Levin in Tr. Bot. inst. AN SSSR, I, V, 271. — *L. obtusifolius* Heyn. Nom. bot. hort. (1840) 477. — *Hyssopus lophanthus* L. Sp. pl. (1753) 569. — *H. resupinatus* Moench, Meth. suppl. (1802) 134. — *Vleckia chinensis* Rafin. Fl. Tellur. III (1818) 89. — *Nepeta lophantha* Fisch. ex Benth. Lab. gen. et sp. (1834) 464. — *Agastache lophanthus* O. Ktze. Rev. gen. II (1891) 511. — *Ice.*: Jacq. Hort. vind. II (1772) tab. 182.

Perennial, puberulent or subglabrous, glandular, green; stems usually many, 20–50 cm long, often divaricately branching; leaves ovate or oblong, obtuse or acute, at base rounded, truncate or subcordate, crenate-dentate, 15–40 mm long, 10–25 mm wide; petioles 2–8 mm long; floral leaves small, linear-lanceolate, approximately as long as cymes or the upper shorter, rarely longer; cymes in axils of upper leaves forming lax inflorescences; middle peduncles 8–12 mm long; calyx subtubular-campanulate, nearly straight or slightly curved, more or less oblique, 6–10 mm long, with hairy ring inside, teeth triangular-lanceolate, $1/4$ – $1/3$ as long as tube, the upper 3 slightly broader; corolla blue, 10–15 mm long, about twice the length of calyx; corolla-tube exerted, dilated above, twisted, the limb inverted; upper (here the lower) lip 2-lobed; lower (here the upper) lip 3-lobed, the middle lobe larger, wider than long, transversely notched, finely toothed, the lateral lobes smaller, broadly oval; upper (here lower) stamens and pistil long-exserted; lower (here upper) stamens not or scarcely exerted; anther-cells slightly diverging; pistil divided above into two thin lobes; nutlets oblong-ovaloid, slightly constricted, smooth, brown. June–August.

Stony slopes, cliffs, debris, ravines, steppes and meadows. — East Siberia: Ang.-Say., Dau. **Gen. distr.**: Mong., Ch. (Hopei). Described from China. Type in London.

2. **L. krylovii** Lipsky in Tr. Bot. sada, XXIV (1905) 122; Kryl. Fl. Zap. Sib. IX, 2305; Levin in Tr. Bot. inst. AN SSSR, V, 274.

Perennial, puberulent, glandular, green to grayish (f. *glabrata* Kryl.) or whitish-gray, with nearly tomentose leaves (f. *canescens* Kryl.); stems numerous, 20–30 cm long, erect or slightly ascending, divaricately branching almost from base, the branches nearly as long as stems; leaves ovate or ovate-triangular, obtuse to subacute, at base subcordate, obtuse or truncate, crenate-dentate, 10–25 mm long, 8–20 mm wide; petioles 3–8 mm long; lower leaves much smaller; floral leaves generally small, linear-lanceolate, usually shorter than cymes, rarely longer; cymes in axils of upper leaves, forming loose inflorescences, these subsessile or short-peduncled; middle peduncles 3–7 mm long; calyx tubular, slightly dilated above, erect, nearly 2-lipped, 6–8 mm long, with hairy ring inside; teeth triangular-lanceolate, $1/4$ – $1/3$ as long as tube, the upper slightly broader; corolla

bluish-lilac, curved, 10–15 mm long, about twice the length of calyx; corolla-tube slightly exerted, gradually dilated above, twisted, the limb inverted; upper (here lower) lip 2-lobed, with broadly oval lobes, lower (here upper) lip 3-lobed, the middle lobe larger, wider than long, notched, finely toothed, the lateral lobes smaller, broadly oval; upper (here lower) stamens and pistil long-exserted, the lower (here upper) not or slightly exerted; anther-cells slightly diverging; pistil divided above into two thin lobes; nutlets oblong-ovaloid, slightly compressed, smooth, brown. June–August.

Alpine belt, dry stony slopes and plateaus, placers and glacial moraines. — West Siberia: Alt. (especially Altai and Naryn Range); Centr. Asia: Dzu.-Tarb. (Tarbagatai, Saur). **Gen. distr.:** Mong. (Mongolian Altai). Described from Altai (Argut River). Type in Leningrad.

3. *L. schrenkii* Levin in Bot. mat. gerb. Bot. inst. AN SSSR, VII, 10 (1937–1938) 218; ibid, Tr. Bot. inst. AN SSSR, V, 276. — *L. chinensis* Benth. in DC. Prodr. XII (1848) 369, p. p.; Ldb. Fl. Ross. III, 372, non Benth. — *Hyssopus lophanthus* Ldb. Fl. alt. III (1830) 398, non L. — **Ic.:** Bot. mat. gerb. Bot. inst. AN SSSR, VII, 10, 219. — Exs.: HFAM, No. 204.

Perennial, hairy or subglabrous, green, very rarely grayish, glandular; stems erect or slightly ascending at base, 20–40 (80) cm long, branching; leaves ovate, cordate at base, obtuse or more or less acute, crenate-dentate, 15–35 (50) mm long, 10–20 (40) mm wide, the petioles 3–15 (30) mm long; upper leaves more or less rounded at base; floral leaves shorter than cymes, often much shorter, small, linear-lanceolate, broadly or narrowly ovate; cymes in axils of upper leaves, forming lax inflorescences, these subsessile or short-peduncled; middle peduncles 2–10 mm long; calyx tubular-campanulate, mostly much dilated above, straight or slightly curved, somewhat oblique, 8–11 mm long, with hairy ring inside; teeth broadly oval-lanceolate, rarely triangular-lanceolate, $1/4$ – $1/3$ as long as tube, the upper three slightly broader; corolla 13–20 mm long, nearly twice the length of calyx, the tube exerted, dilated above, twisted, the limb inverted; upper (here lower) lip 2-lobed, lower (here upper) lip 3-lobed, the middle lobe larger, broader than long, transversely notched, finely toothed, the lateral lobes smaller, broadly oval; upper (here lower) stamens not or slightly exerted; anther-cells slightly diverging; pistil long-exserted, divided into two thin lobes; nutlets oblong-ovaloid, slightly compressed, smooth, brown. May–July.

Rocks, stones, shale taluses, stony slopes, grass plots. — Centr. Asia: Balkh. (Kent and Bektau-Ata mountains), T. Sh. (Kara-Tau, Talass Ala-Tau, Chatkal Range, Kirghiz Ala-Tau, Chu-Ili mountains), Dzu.-Tarb. (Dzungaria-Ala-Tau, Saur). **Gen. distr.:** Dzu.-Kash. (E. T. Sh.). Described from Bektau-Ata mountains. Type in Leningrad.

4. *L. tschimganicus* Lipsky in Tr. Bot. sada, XXIII (1904) 212; Levin in Tr. Bot. inst. AN SSSR, 1, V, 277.

Perennial, short-hairy, glandular; green; stems many, erect or slightly ascending, 30–35 cm long, branching; leaves broadly ovate, usually obtuse, cordate at base, crenate-dentate, 10–20 mm long, 6–15 mm wide; petioles 1–6 mm long; lower leaves often subreniform, small, obtuse or tapering at base; uppermost leaves subsessile, often linear-lanceolate; cymes in axils of upper leaves, forming lax peduncled inflorescences; middle peduncles 7–12 mm long; bracts small, linear-lanceolate; calyx tubular or tubular-campanulate, erect,

slightly oblique, 7-9 mm long, with hairy ring inside, the teeth triangular-lanceolate, 1/4 to 1/3 as long as tube, the upper 3 slightly broader, corolla dingy lilac, 13-18 mm long, about half the length of calyx; tube much exserted, slightly dilated above, twisted, the limb inverted; upper (here lower) lip 2-lobed; lower (here upper) lip 3-lobed, the middle lobe larger, broader than long, transversely notched, finely toothed, the lateral lobes smaller, broadly oval; all stamens included or nearly so; anther-cells slightly diverging; pistil long-exserted, divided above into two thin lobes; nutlets oblong-ovaloid, slightly compressed, smooth, brown. June-August.

Grassy slopes. — Centr. Asia: T. Sh. (Tashkent Ala-Tau: Chimgan, Chatkal River). Endemic. Described from Chimgan. Type in Leningrad.

5. *L. schtschurowskianus* (Rgl.) Lipsky in Tr. Bot. sada, XVIII (1901) 93; Levin in Tr. Bot. inst. AN SSSR, ser. 1, V, 279. — *L. schtschurowskianus* β . *kulabensis* Lipsky, l. c. p. p. — *Nepeta schtschurowskiana* Rgl. in Izv. Obsch. lyub. est. antr. i etn. XXXIV, 2 (1882) 63, 66. — *Nepeta ourumitanensis* Franch. in Ann. Sc. Nat. sér. VI XVIII (1884) 230.

280 Perennial, subglabrous or puberulent, glandular, green; stems erect, rarely ascending, 30-70 cm long, branching; leaves ovate-cordate or ovate-oblong, usually rounded at base, crenate-dentate, 20-40 mm long, 10-30 mm wide; petioles 5-20 mm long; floral leaves small, linear-lanceolate; inflorescence leafless, rarely all leaves large and then inflorescence leafy; cymes in axils of upper leaves, forming lax long-peduncled inflorescences; middle peduncles 15-20 mm long; calyx tubular-campanulate, straight, very slightly oblique, 8-10 mm long, with hairy ring inside; teeth oval-lanceolate or lanceolate, 1/4 to 1/3 as long as tube, the upper 3 slightly broader; corolla dingy lilac (?), 15-20 mm long, 2 to 3 times the length of calyx, the tube exserted, dilated above, twisted, the limb inverted; upper (here lower) lip 2-lobed; lower (here upper) lip 3-lobed, the middle lobe larger, broader than long, transversely notched, finely toothed, the lateral lobes much smaller, broadly oval; all 4 stamens long-exserted, rarely only 2 or none; anther-cells slightly diverging; pistil long-exserted, divided into two thin lobes; nutlets oblong-ovaloid, slightly compressed, smooth, brown. May-July.

Mainly in Central Asian juniper belt, grassy slopes, scrub, dry stony slopes, dry riverbeds, alpine stands, 2100-3000 m. — Centr. Asia: Pam.-Al. (Turkestan Range, basin of Zeravshan, Malyi Alai, Alai Range, Trans-Alai Range), T. Sh. (Fergana Range). Described from Alai Range. Type in Leningrad.

6. *L. lipskyanus* Ik.-Gal. et Nevski in Tr. Bot. inst. AN SSSR, 1, IV (1937) 325; Levin, ibid. V (1940) 281. — *L. schtschurowskianus* β . *kulabensis* Lipsky in Tr. Bot. sada, XVIII (1901) 83, p. p.

Perennial, plant subglabrous or puberulent, glandular, green; stems erect, rarely ascending, 30-70 cm long, branching; leaves ovate-cordate or ovate-oblong, usually rounded at base, crenate-dentate, 20-40 mm long, 10-30 mm wide; petioles 5-20 mm long; floral leaves very small, linear-lanceolate; inflorescence leafless, rarely all leaves large and then inflorescence leafy; cymes in axils of upper leaves, forming loose, long-peduncled inflorescences; middle peduncles 15-20 mm long; calyx tubular, straight, very slightly oblique, 8-9 mm long, with hairy ring inside; teeth narrowly lanceolate, rarely triangular-lanceolate,

acute, often point-tipped, $1/4$ to $1/3$ as long as tube; corolla blue with lilac tinge, 15–20 mm long, 2–3 times the length of calyx; tube exserted, dilated above, twisted, the limb inverted; upper (here lower) lip 2-lobed, lower (here upper) lip 3-lobed, the middle lobe larger, broader than long, transversely notched, finely toothed, the lateral lobes smaller, broadly oval; all 4 stamens long-exserted, rarely only 2 or none; anther-cells slightly diverging; pistil divided into two thin lobes; nutlets oblong-oval, slightly constricted, smooth, brown. May–August.

Mainly in Central Asian juniper belt. Slopes in large-herb-and-grass steppes, stony juniper-covered slopes, alt. 2000–3000 m. — Centr. Asia: Pam.-Al. (Samarkand mountains, basin of Zeravshan, Zeravshan Range, Kugitang, Kulyab, Shugnan). Endemic. Described from Ala-Kisrak east of Kulyab. Type in Leningrad.

7. *L. subnivalis* Lipsky in Tr. Bot. sada, XXIII (1904) 209; Levin in Tr. Bot. inst. AN SSSR, ser. 1, V, 284. — *L. subnivalis* β . *tomentosa* Lipsky, op. cit. 212. — *L. tomentosus* Rgl. in Izv. Obshch. lyub. est., antr. i etn. XXXIV, 2 (1882) 63, non Forst. (1776). — *Agastache tomentosa* O. Ktze. Rev. gen. (1891) 511. — *Nepeta neweskyi* Lipsky, op. cit. 226.

Perennial, gray-tomentose, sometimes nearly white, rarely greenish (α *virescens* (Lipsky) O. et B. Fedtsch.), glandular; stems numerous, erect, rarely ascending, 10–50 cm long; branches from near base and often reaching length of stem; leaves ovate, subcordate or rounded at base, obtuse, generally plicate-rugose, with prominent veins and crisp-crenate margins, 5–15 mm long, 3–12 mm wide, short-petioled; upper leaves sessile, often all leaves subsessile; petioles 0.5–7 mm long; floral leaves very small, linear-lanceolate; inflorescence leafless; cymes in axils of upper leaves, forming loose short-peduncled or subsessile inflorescences; middle peduncles 2–8 mm long; calyx tubular, slightly dilated above, more or less curved, 2-lipped or nearly so, 6–9 mm long, with hairy ring inside; teeth triangular-lanceolate, $1/4$ to $1/3$ as long as tube, the upper 3 slightly broader; corolla lilac, 10–15 mm long, about twice the length of calyx, the tube exserted, slightly dilated above, twisted, the limb inverted; upper (here lower) lip 2-lobed; lower (here upper) lip 3-lobed, the middle lobe larger, broader than long, transversely notched, finely toothed, the lateral lobes smaller, broadly oval, upper (here lower) stamens and pistil long-exserted, the lower (here upper) not or slightly exserted; anther-cells slightly diverging; pistil divided above into two thin lobes; nutlets oblong-ovaloid, slightly compressed, smooth, brown. June–September.

Alpine belt, stony slopes, taluses, pebbles, juniper shale, high-mountain steppes, near glaciers, 2100–2400 m. — Centr. Asia: Pam.-Al. (Turkestan Range, basin of Zeravshan, Zeravshan Range, Gissar Range, Peter the First Range, Alai Range, Alai valley, Trans-Alai Range), T. Sh. (Mogol-Tau). Described from Gissar Range. Type in Leningrad.

8. *L. elegans* (Lipsky) Levin in Tr. Bot. inst. AN SSSR, ser. 1, V (1940) 288. — *Nepeta elegans* Lipsky in Tr. Bot. sada, XXIII (1904) 224 and XXVI (1909) 502.

Perennial, puberulent, grayish, glandular; stems numerous, 30–70 cm high, erect, branching; branches nearly from base, often as long as stems; leaves ovate-triangular, oblong-ovate or oval, rounded or truncate or tapering at base, coarsely dentate to nearly incised, usually plicate-rugose, very prominently veined, 6–13 mm long, 3–7 mm wide,

petioles 2–6 mm long; upper leaves very small, much shorter than cymes, sessile; inflorescence leafless or somewhat leafy; cymes in axils of upper leaves, forming lax peduncled inflorescences, middle peduncles 5–12 mm long; bracts small, linear-lanceolate; calyx straight, tubular, scarcely dilated above, straight at throat, 6–9 mm long, with hairy ring inside at throat, the teeth linear-lanceolate or lanceolate, two-thirds as long to nearly as long as tube; corolla blue, 15–18 mm long, 2–2½ times the length of calyx, the tube long-exserted, gradually dilated above, twisted, the limb inverted; upper (here lower) lip 2-lobed, lower (here upper) lip 3-lobed, the middle lobe larger, broader than long, transversely notched, finely toothed, the lateral lobes smaller, broadly oval; stamens not exserted or the upper (here the lower) slightly so; anther-cells slightly diverging; pistil exserted, divided above into two thin lobes; nutlets oblong-ovaloid, slightly compressed, smooth, brown. May–September.

Stony slopes, rock crevices, taluses. — Centr. Asia: Pam.-Al. (Darvaz, Roshan, Shugnan).

Gen. distr.: Iran (Afghanistan, Badakhshan). Described from Afghanistan Badakhshan (Omar on Pyandzhe). Type in Leningrad.

Genus 1253.* **Schizonepeta**** Briq.

Briq. in Pflanzenfam. IV, 3a (1897) 235. — *Saussuria* Moench, Meth. pl. (1794) 388, non *Saussurea* DC. 1870 nom. const. — *Nepeta* sect. *Schizonepeta* Benth. Lab. gen. et sp. (1834) 468.

283 Calyx 15-nerved, obconical, slightly curved, with oblique throat, without hairy ring inside; corolla-tube glabrous inside, curved, above rather strongly expanding at the neck, exserted from calyx; upper lip erect, slightly concave, bifid; lower lip spreading, tripartite, the middle lobe unguiculately tapering at base, its upper part strongly broadening, notched at apex, the margins crenate, involute, the lateral lobes much smaller; all 4 stamens perfect, the upper ascending under the upper lip, the lower projecting forward; anther-cells parallel at first, later diverging at nearly a right angle; style split above into two subequal lobes; disk with 4 well developed lobes, the lower lobe sometimes much larger than the others; nutlets smooth, glabrous, with basal attachment between disk lobes; areola rather indistinct. Perennial or annual herbs, with pinnatisect (sometimes partly simple) leaves and small flowers forming terminal spikelike inflorescences.

Three species are included in the genus: two from Siberia and one from N. China.

1. Leaves twice pinnatisect or divided into thin lobes; calyx-teeth aristate, corolla whitish. 2. **S. annua** (Pall.) B. Schischk.
- + Leaves once pinnatifid, dissected, rarely divided into broader lobes, sometimes all entire; calyx-teeth not aristate; corolla blue-violet . . . 1. **S. multifida** (L.) Briq.

1. **S. multifida** (L.) Briq. in Pflanzenfam. IV, 3a (1897) 235; Kryl. Fl. Zap. Sib. IX, 2315. — *Nepeta multifida* L. Sp. pl. (1753) 572 (non L. fil. 1781). — *N. lavandulacea* L. fil. Suppl. (1781) 272; Bge. in Ldb. Fl. Alt. II, 404; Benth. Lab. gen. et sp. 468; in

* Treatment by A.I. Poyarkova.

** From the Greek *schizein*, to split, and the Latin *nepeta* — name for catmint.

DC. Prodr. XII, 370; Ldb. Fl. Ross. III, 372; Turcz. Fl. baic.-dahur. II, 402; Kom. Fl. Man'chzh. III, 353; Kom. and Alis. Opred. rast. Dal'nevost. kraya, II, 900. — *Saussuria pinnatifida* Moench, Meth. (1794) 388. — *Nepeta lobata* Rudolph ex Steud. Nomencl. (1821) 552. — *Lophanthus multifidus* Benth. in Bot. Reg. XV, ad calc. No. 1282. — Ic.: Rchb. Ic. bot. tab. DXXX, fig. 726; Tr. SOPS, ser. sibirskaya, 3 (1932) Fig. 19. — Exs.: GRF, No. 1234a, 1234b.

Perennial; root woody, longitudinally splitting, passing into woody rhizome, this branching above; stems few, 15–60 cm high, 1.5–3 mm thick, erect or ascending, simple or with 1 or 2 pairs of mostly short fertile branches in upper part, covered with rather long spreading hairs, especially in lower part and at nodes, and short tightly appressed hairs; leaves 1.5–6 cm long, 1–4 cm wide, with sparse appressed fine hairs above and long coarser hairs beneath usually confined to veins; lower leaves on petioles about as long as blade, orbicular-ovate to oblong-ovate, coarsely and obtusely toothed, rarely pinnatilobate; middle leaves sometimes similar to the lower or deeply pinnatifid or pinnatisect pinnatipartite, with 3–5 (7) entire (the lower sometimes denticulose) obtuse or rarely acute segments or lobes; upper leaves short-petioled, usually more deeply cut than the middle, with acute or acuminate lobes; sometimes all leaves entire or all pinnatisect; verticillasters 8–20-flowered, crowded in cylindrical, spicate, usually dense, rarely lax inflorescences 3–13 cm long, 0.7–1.5 cm thick, the lowermost 1 or 2 (3) verticillasters sometimes distant; lower floral leaves green, pinnatipartite, the next entire, the others (and often all) broadly ovate, strongly attenuate or acuminate, terminating in a long point, mostly bright blue, entire, with short appressed hairs on the outside, the margin long-ciliate; bracts 1.5–2.5 mm long, ovate or lanceolate-ovate; pedicels 0.5–1 mm long; calyx 4.5–5 mm long, glaucescent, puberulent and beset with minute short-stipitate whitish glands and much larger orbicular sessile yellow glands, at margin of throat with 5 small lumpy thickenings between the teeth; teeth triangular, acute or acuminate; corolla bluish-violet, 8–10 mm long, twice the length of calyx, puberulent outside, with longer hairs on lobes of lips; upper lip ca. 2.5 mm long, cut to 1/3 or deeper into ovate acuminate lobes; lower lip half as long again as the upper, with lateral lobes of similar shape but half as large again, the middle lobe obovate in upper part, obtusely crenulate, abruptly attenuate to rather long claw; stamens exceeding upper lip; nutlets brown, oblong, rounded at apex, pointed at base, 1.5–1.7 mm long, 0.6–0.8 mm wide. Fl. June–August, fr. July–September. (Plate XIV, Figure 3.)

Steppe zone and adjacent parts of forest zone, meadows, exposed grassy and stony slopes of river banks, hills and mountains; in mountains reaching the limit of forest vegetation. — West Siberia: Ob (southern part, rarely), Irt., Alt.; East Siberia: Ang.-Say., Dau., Lena-Kol. (southern part); Far East: Ze.-Bu., Uda, Uss. **Gen. distr.:** Mong., Ch. (Manchuria). Described from Dauria. Type in London.

Note. Very often specimens of *S. multifida* occur with female flowers (female dioecism); such flowers are distinguished by the corolla-tube being less dilated above and the limb narrower, the middle lobe differently shaped (narrower), staminodes with very small rudiments of anthers, and short filaments included in the tube.

Economic importance. The essential oil of *N. multifida* is translucent, pale yellow and has a pleasant, delicate peppermint odor; it is suitable for perfuming soap (Prokhorova and Lebedev, 1932).

2. *S. annua* (Pall.) B. Schischk. in Sched. Herb. Fl. Ross. X, f. LXIV (1936) 72; Kryl. Fl. Zap. Sib. IX, 2314. — *Nepeta annua* Pall. in Acta Acad. Petr. 1779, II (1783) 263. — *N. multifida* L. fil. Suppl. (1781) 273, non L. (1753). — *N. botryoides* Sol. in Ait. Hort. Kew. ed. I, 2 (1789) 287; Benth. Lab. gen. et sp. 468; in DC. Prodr. XII, 370; Ldb. Fl. Ross. III, 372. — *N. bipinnatifida* Cav. Ic. rar. I (1791) 36. — *Schizonepeta botryoides* Briq. in Pflanzenfam. IV, 3a (1897) 235; O. and B. Fedch. Perech. rast. Turk. V, 139. — **lc.**: Pall. l. c. tab. 12; Cav. l. c. tab. 49; Tr. SOPS, ser. sibirskaya, 3 (1932) Fig. 18. — **Exs.**: GRF, No. 3150.

Annual; stems solitary or few, 9–40 cm long, to 4.5 mm thick, erect or ascending, usually branching from base, covered with simple retrorse hairs (longer and spreading in lower part) and minute whitish sessile capitate glands; axillary branches leafy, terminating in inflorescence, usually branching in turn, the branches sometimes fertile; leaves to 4 (4.5) cm long, 3 cm wide, broad-ovate or oblong-ovate, deeply bipinnatisect or divided into linear, oblong or some into oblong-ovate, entire lobes, obtuse or rounded at apex, covered on both sides (more densely beneath) with fine appressed hairs sparsely interspersed with small capitate, white glands and larger orbicular flat yellow resinous glands; petioles in lower leaves as long as or slightly longer than blade, in upper leaves short; verticillasters 6–10-flowered, crowded at summit of stem and axils of branches into narrow, spicate, dense inflorescence, sometimes loose in lower part, 2–10 (12) cm long, 7–15 mm wide (without corollas); lower bracts pinnatifid, the others entire, linear-lanceolate, acuminate, approximately as long as calyces; bracts linear-subulate, short; pedicels 1–3 mm long, all covered, like calyx, with simple spreading articulate hairs interspersed with stipitate or sessile capitate whitish glands and yellow sessile resinous glands; calyx 5–6 mm long, with distinctly oblique throat; teeth ovate, abruptly attenuate to aristate point, the upper 3 ca. half as long as tube, the lower smaller; corolla 7.5–8 mm long, about half as long again as calyx, whitish, pubescent and glandular outside, with dense fascicle of long hairs on upper lip and middle lobe; upper lip shallowly bifid, with semiorbicular lobes; 286 lower lip half as long again as the upper; the middle lobe apparently concave, cuneate, unguiculate, the very broad limb usually emarginate, remotely and unevenly crenate, the lateral lobes half as long as middle lobe, broadly ovate; stamens with blue anthers, the upper scarcely exerted; nutlets dark brown, oblong, with rounded apex and pointed base, 1.5–1.6 mm long, 0.6–0.7 mm wide. Fl. July–August; fr. from first half of August.

Steppes, on stony slopes and rocks; mountains 1000–2000 m in steppe and desert coenoses, stony and gravelly slopes, pebble-beds of mountain streams. — West Siberia: Alt.; East Siberia: Ang.-Say. (western part). **Gen. distr.**: Mong. (mountains and foothills of western and central Mongolia). Described from Central Siberia, between Yenisei and Yus rivers. Type in Paris.

Economic importance. The aerial part of the plant (dried) yields 0.56% oil which is pale yellow, very mobile, soluble in alcohol and in odor reminiscent of some species of the genus *Thymus*. It contains up to 55% thymol (Pigulevskii and Chistova, 1935). The oil appears to be of little interest to the perfume industry, but it can be used as a source of thymol.

Genus 1254.* **Nepeta**** L.

L. Sp. pl. (1753) 570, p. p. — *Cataria* Adans. Fam. II (1763) 192 .

Plants usually with bisexual flowers (some of these displaying gynodioecism or gynomonoeicism), more rarely gynodioecious or dioecious. Calyx (13–17)–15-nerved, cylindrical, tubular or obconical, rarely campanulate (often enlarged, ovoid in fruit), curved or straight, naked inside, with more or less oblique, rarely 2-lipped or almost straight throat; corolla small or medium; tube without hairy ring inside but sometimes with a fringe of bristly hairs at throat, narrow in lower part, usually abruptly expanding, rarely gradually dilated toward limb; upper lip erect or slightly inclined forward, tripartite, the middle lobe much larger than the lateral, concave or nearly flat or with drooping lobules, entire or dentate; throat of limb broad, bordered by base of lateral lobe; stamens parallel, ascending under upper lip of corolla, the upper stamens about equaling the latter, the lower stamens slightly (rarely much) shorter than the upper, all perfect; anther-cells ellipsoid, usually diverging at an angle of 180° , rarely at an angle approaching 90° , their cavities not fusing; in female flowers stamens transformed into staminodes, concealed in broadened part of corolla-tube; disk 4-lobed, usually regular, sometimes the lower lobe distinctly larger than the others; style 2-lobed, the lobes subequal; nutlets obovoid or ellipsoid, rarely ovoid, smooth, granular or tuberculate, each nutlet attached by 2, often fusing, small, basal, generally oblique surfaces to 2 adjacent disk lobes. Herbs varying in habit, mostly perennials, rarely annuals, very rarely subshrubs, with dentate leaves; upper floral leaves mostly strongly reduced, bracteiform; bracts usually not longer than calyx, narrow, very rarely as long as flowers or exceeding them. Flowers in half-whorls, usually forming verticillasters, these distant or crowded in spicate or capitate inflorescences, or flowers disposed in remote pairs of cymes forming racemose or panicle inflorescences.

The genus contains some 250 species (82 in the USSR), that are distributed only in the Old World, from the Pacific Ocean (Japan, Korea, Maritime Territory) to the Atlantic (Spain, Morocco, Canary Islands). A very large number of the species grow in the mountains of the ancient Mediterranean region, from foothills to the alpine belt.

Note. The widest variation of type and the greatest abundance of species within the genus *Nepeta* is to be found in two regions: Southwest Asia (especially Iran) and western Himalayas including adjacent Hindu Kush. In the USSR most of the species are concentrated in the mountains of Transcaucasia and Central Asia. The origin of the Central Asian species is connected with the Himalaya-Hindu Kush development center of *Nepeta*, since most of them belong to sections that are exclusively or predominantly represented in the Himalayas and in Afghanistan (*Glechomanthe*, *Capituliferae*, *Spicatae*). There are also East Asian links via the section *Macronepeta*. The Caucasian species, with few exceptions, belong to sections of the Southwest Asian center (*Schizocalyx*, *Micronepeta*, *Oxynepeta*, *Micranthae*, and subsection *Tuberculatae* of *Cataria*).

In the century that has passed since the publication of Bentham's monograph (1834 and in DC. Prodr. 1848), the genus *Nepeta* as a whole has not been revised. A new monographic treatment is obviously necessary in view of the accumulation of vast material

* Treatment by A.I. Poyarkova.

** Pliny's name for one of the Labiatae; from *Nepeta*, *Nepet* (modern *Nepi*), an Etrurian city.

288 and the fact that the number of species known to science has more than doubled. Catmints of Southwest Asia have been investigated more thoroughly than others thanks to the work of Boissier, Bunge, Stapf, Bornmüller, Bordzilovskii, Rechinger and others. In the USSR studies worthy of attention, other than the treatment by Boissier, are those by such Russian botanists as Meier (1831), Regel' (1880), Lipskii (1900, 1904, 1909), Grossgeim (1928, 1932, 1944, 1949) and Kudryashev (1947). Briquet's classification (Pflanzenfam. IV, 3a, 1897), the second for the genus as a whole, is successively linked up with the classification proposed by Bentham and was later considerably revised in parts by Boissier in application to the flora of the Near East. Briquet's contribution consists mainly in breaking down Boissier's composite subsections into smaller and more natural entities. In the present volume we have followed Briquet's system in that part which, in our view, corresponds to the phylogenetic relations in the genus. It appears natural to us to interpret the following earlier established supergeneric categories as sections: *Orthonepeta* Benth., *Oxynepeta* Benth., *Capituliferae* Benth., *Micranthae* Boiss., *Longiflorae* Boiss. (renamed *Schizocalyx* Pojark. on formal grounds) and *Spicatae* Benth. The rest of the system has been more or less revised. In reconstructing the system we proceeded from phylogenetic series (in the Komarov sense), combining closely related series in subsections and related subsections in sections. Much attention was focused on the structure of the flower and in particular on details of corolla structure, which had been largely ignored by earlier authors. In the course of our work it proved necessary to remove a number of Central Asian species from *Nepeta* and consequently to set up two new genera, *Kudrjaschevia* Pojark. and *Drepanocarium* Pojark.

Economic importance. Species of *Nepeta* yield essential oil, but only a few of them have been investigated in this respect. Some of the species studied were found to be of little interest to the perfume industry, while the essential oil of others, e.g. *N. podostachys*, is highly valued. Deserving of special interest are the Central Asian species among which (in sections *Capituliferae*, *Glechomanthe*, *Spicatae*) are some with a very strong, persistent and mostly agreeable scent. Some species have long been used as ornamentals (*N. sibirica* L., *N. grandiflora* M.B.), and their number could undoubtedly be increased. Most species are nectariferous.

- 1. Perennials, with woody, more or less thick root and often with well developed rhizome 2.
- + Annuals, with short and slender root 68.
- 2. Flowers in large globular terminal head; floral leaves and bracts numerous, violet, large, exceeding flowers, 1.5-2.3 cm long; leaves cuneate, with unequally incised or deeply dentate undulate margin 3.
- + Floral leaves and bracts small, 2-8 (10) mm long, not exceeding calyx, narrow, inconspicuous; leaves different 4.
- 3. Floral leaves subtending verticillasters obovate-cuneate or lanceolate-elliptic, bracts linear-lanceolate; flowers large; calyx 9-12 mm long; corolla 18-22 mm long 2. *N. lipskyi* Kudr.
- + Lower floral leaves subtending verticillasters in the head cuneate; other floral leaves and bracts linear or narrowly linear, finely long-acuminate; flowers smaller; calyx 7-8 mm long; corolla 15-18 mm long 1. *N. longibracteata* Benth.

4. Leaves spinose and unevenly sharp-toothed; plant very densely leafy; flowers in distant verticillasters; cymes 2-5-flowered; floral leaves resembling cauline leaves; corolla with long tube gradually expanding into narrow throat 3. **N. glutinosa** Benth.
- + Teeth of leaves not spinescent; aggregate characters different 5.
5. Plants usually gynodioecious or dioecious; calyx straight, with nearly straight (rarely slightly oblique) throat and straight erect subulate teeth 6.
- + Flowers bisexual*; calyx with more or less oblique or 2-lipped throat, the teeth not subulate, at least the lower more or less curved 14.
6. Flowers in cymes grouped at ends of stem and axillary branches into small lax pyramidal racemes; flower in cyme bifurcations sessile; corolla completely (rarely only to limb) included in calyx; lower lip of corolla obliquely ascending, nearly parallel to upper lip (section *Oxynepete*) 7.
- + Flowers in cymes grouped at ends of stems and axillary branches into mostly long narrow racemes; flower in cyme bifurcations pediceled; corolla included in calyx to dilated part of tube, rarely higher; lower lip of corolla more or less downturned, nearly perpendicular to upper lip (section *Orthonepete*) 11.
7. Corolla azure or blue; stipitate glands usually absent or, rarely, few, confined to petiole (series *Parviflorae*) 8.
- + Corolla yellow; all plant parts (except corolla) densely beset with short stipitate capitate lustrous glands 75. **N. erivanensis** Grossh.
8. Calyx 6-7.5 (8) mm long, tube subglobular in fruit; cymes very compact; stem usually villous all over or at least in lower part, with long spreading hairs 71. **N. parviflora** M.B.
- + Calyx (8) 9-12 (13) mm long, violet-blue, the tube narrowly cylindrical or ovoid-cylindrical in fruit; stem with different vesture or glabrate 9.
9. Stem, leaves and calyx scabrous, with very short hairs antrorsely curved from thickened base; floral leaves and often several pairs of upper cauline leaves entire; nutlets prominently tuberculate 73. **N. schischkinii** Pojark.
- + Stem with short hairs intermixed, at least in lower part, with long ones (simple white and pellucid viscous); calyx covered at least in lower part with long fine white spreading hairs; all cauline leaves and at least lower floral leaves dentate; nutlets indistinctly foveolate-tuberculate 10.
10. Plant densely leafy, leaves being much longer than internodes; leaves dark green, dull; stem covered densely in lower part, sparingly above (often also on lower side of leaves), with long fine pellucid viscous hairs; calyx-tube cylindrical-obconical in flower, subovoid in fruit 74. **N. kopetdaghensis** Pojark.
- + Plant sparsely leafy; leaves much shorter than internodes, pale green, more or less glossy; stems covered with short upcurved hairs, mixed on ribs with longer simple white hairs; calyx-tube narrowly cylindrical in flower, cylindrical or rarely ovoid-cylindrical in fruit 72. **N. ucrainica** L.
11. Flowers yellowish or cream-colored with yellow lower lip; nutlets hairless at apex (cycle *Sulphureae*) 12.

* Individuals with both female and bisexual flowers or with female flowers alone occur occasionally.

- + Flowers pale violet (lilac), rarely pinkish or white, with lilac lip; calyx and bracts more or less violet-tinged or green; nutlets usually hairy at apex 67. **N. pannonica** L.
- 12. Plant all gray, with dense, very fine soft implexed hairs; cauline leaves sessile. 69. **N. sintenisii** Bornm.
- + Plant green, with minute hairs indiscernible without magnifying glass; cauline leaves (except the upper) distinctly petiolate. 13.
- 13. Flowers small; calyx 5.5–7 mm long; corolla 8–10 mm long, included in calyx nearly to the limb 68. **N. sulphurea** C. Koch.
- 291 + Flowers larger; calyx 8–10 mm long; corolla 12.5–16 mm long, included in calyx only to base of dilated part of tube 70. **N. komarovii** E. Busch.
- 14. Stems, inflorescence, lower and often also upper side of leaves covered with thick layer of loose, snow-white tomentum; verticillasters numerous, mostly sessile, only the lower short-peduncled; corolla tube slightly exserted; nutlets oblong 27. **N. olgae** Rgl.
- + Indument rather dense, not tomentose or if so then grayish; aggregate of other characters different. 15.
- 15. Inflorescence of very distant pairs of small (2) 4–6-flowered capitate semiverticels; floral leaves and bracts ovate-lanceolate or lanceolate; most semiverticels sessile, only the lower on peduncles 0.7–2 cm long 26. **N. ladanolens** Lipsky.
- + Flowers in semiverticels or in verticillasters composed of noncapitate cymes or, if semiverticels capitate, then many-flowered with peduncles 1.5–5 (9) cm long, the floral leaves and bracts narrowly linear to filiform 16.
- 16. Flowers in many-flowered hemispherical capitate remote semiverticels with developed peduncles; floral leaves and bracts narrowly linear 17.
- + Flowers in cymes or in noncapitate semiverticels, these remote or grouped in pairs in verticillasters or crowded in spicate terminal inflorescence 19.
- 17. Stems leafy nearly to summit, with numerous leafy axillary branches, these branching in turn; general inflorescence paniculate 25. **N. badachschanica** Kudr.
- + Stems leafy and branching only in lower part; elongate leafless peduncles produced above in axils of small bracteiform leaves; general inflorescence a sparse raceme 18.
- 18. Peduncles straight; leaves firm, thick, covered on both sides like petioles and young stems, with very short dense tomentum 24. **N. pseudofloccosa** Pojark.
- + Peduncles arched; leaves thin, pubescent or rather loosely tomentose; petioles and young stems with arachnoid indument of long hairs. 23. **N. vakhanica** Pojark.
- 19. Corolla-tube half as long again as calyx, gradually expanding toward limb, without clearly delineated neck 20.
- 292 + Corolla-tube abruptly dilated into wide clearly delineated neck 21.
- 20. Calyx cylindrical, tubular (scarcely dilated above), the teeth straight, gradually acuminate, 1/3–2/5 as long as tube 4. **N. knorringiana** Pojark.
- + Calyx obconical, dilated above, the teeth 2/3 as long as tube, abruptly terminating in a long slender recurved point 5. **N. subhastata** Rgl.
- 21. Calyx with a fairly broad elliptical slit situated in front, below base of lower teeth, and occupying half to nearly 2/3 of the tube; throat strongly oblique, nearly 2-lipped (section Schizocalyx). 22.

- + Calyx without frontal slit 30.
22. Corolla (20) 22–27 mm long, the tube $2\frac{1}{2}$ times as long as calyx and $3\text{--}3\frac{1}{2}$ as long as limb (series Longitubae) 23.
- + Corolla 11.5–20 mm long, the tube $1\frac{1}{2}\text{--}2$ times as long as calyx and $1\frac{1}{2}\text{--}2\frac{1}{2}$ times as long as limb 24.
23. Flowers in few-flowered cymes; upper cymes sessile, crowded in a loose, (6) 10–12-flowered head, the other 2–5 pairs distant, short-peduncled; calyx 7–9 mm long, the teeth $4\frac{1}{2}$ to 6 times shorter than tube 58. **N. longituba** Pojark.
- + Flowers in semiverticels clustered at ends of stem and axillary branches in a dense, many-flowered head, sometimes 1 pair of semiverticels remote; calyx 9–12 mm long, the teeth 4 to $5\frac{1}{2}$ times shorter than tube 59. **N. sosnovskyi** Asker.
24. Flowers in dense semiverticels, the upper pairs of these sessile, crowded in a terminal head, the lower 1 to 4 remote, pedunculate; nutlets smooth (series Brevifoliae) 25.
- + Flowers in distant peduncled cymes, these forming a racemose or paniculate inflorescence; nutlets very finely tuberculate (cycle Fissae) 26.
25. Inflorescence of a lax 8–14-flowered head and 1–2 (3) remote pairs of semiverticels; lower peduncles 1.2–2.5 cm long; leaves to 17 mm long and as wide 65. **N. brevifolia** C. A. M.
- + Inflorescence consisting of a dense (20) 30–50-flowered head and 2–4 pairs of remote semiverticels; lower peduncles 18–30 mm long; leaves to 35 mm long and wide 66. **N. lamiifolia** Willd.
26. Stems, petioles and lower side of leaves (especially veins) densely covered with long white patent articulate hairs; all plant parts (except corolla) densely covered with very small subsessile short-stipitate capitate glands 61. **N. trautvetteri** Boiss. et Buhse.
- 293 + Long patent white hairs and capitate glands absent 27.
27. Stems and leaves velutinous to the touch, with very short simple hairs, these bloom-like on stems, corolla 11.5–15 mm long, the tube exerted from calyx for $\frac{1}{3}$ its length 62. **N. velutina** Pojark.
- + Indument not velutinous, longer and sparser; corolla 17–19 mm long, tube exerted to about the middle 28.
28. Stems developing long axillary flowering branches nearly all way up from base; cymes remote, nearly all (except the upper) diffusely dichotomous; general inflorescence a large, very lax panicle 60. **N. fissa** C. A. M.
- + Plant less branching, stems commonly with few axillary branches; upper semiverticels approximate, the lower distant, only the latter distinctly dichotomous, general inflorescence a more or less contracted raceme, rarely a panicle 29.
29. Stems and leaves scabrous to the touch, with short recurved hairs; leaves with ovate or triangular teeth; calyx (7.5) 9–10.5 mm long, the teeth $4\frac{1}{2}$ to $5\frac{1}{2}$ (6) times shorter than tube 64. **N. iberica** Pojark.
- + Stems and leaves smooth to the touch; leaves crenate; calyx 6.5–8 mm long, the teeth $3\frac{1}{2}$ to $4\frac{1}{2}$ times shorter than tube 63. **N. daghestanica** Pojark.
- 30(21). Middle lobe of lower lip of corolla concave, cup-shaped, with coarsely toothed involute margins, without basal bulge; nutlets more or less distinctly tuberculate (smooth only in *N. cataria* L.) (section Cataria) 31.

- + Middle lobe of lower lip of corolla with basal swelling wedging out toward its notched apex, the flat lobules drooping or almost horizontally spreading; nutlets always smooth. 47.
31. Nutlets smooth; calyx 5–7 mm long, ovoid in fruit, corolla 7.5–10 mm long, dingy-white; flowers in dense compound semiverticels forming dense racemes at ends of stem and axillary branches 33. **N. cataria** L.
- + Nutlets tuberculate (magnifying glass!); flowers large; aggregate of characters different 32.
- 294 32. Flowers in verticillasters crowded at summit of stem in dense spicate inflorescence (sometimes 1 or 2 verticillasters distant); calyx almost straight, the throat scarcely oblique; stems erect, simple; leaves upright (series *Betonicaefoliae*) 33.
- + Flowers in verticillasters or cymes, these all remote or only the upper loosely grouped; aggregate of other characters different 35.
33. Stems and leaves densely gray-pubescent; calyx almost tomentose with implexed hairs, 8.5–10 mm long 39. **N. betonicifolia** C.A.M.
- + Bright green plants with sparser and hardly visible (magnifying glass!), minute fine appressed hairs; calyx covered with straight antrorse hairs (on tube sometimes spreading). 34.
34. Corolla lilac, 18–23 mm long, the tube exerted from calyx for 2–3 mm; semiverticels with up to 20 flowers; leaves commonly very sparsely hairy, the largest 4–9 cm long, 1.5–4 cm wide 40. **N. somkhetica** Kapell.
- + Corolla violet-blue, 15–17 mm long, tube exerted from calyx for 1.5–2 mm; semiverticels with up to 10 flowers; leaves densely hairy, the largest 2.5–4.8 mm long, 1.8–2.7 mm wide 41. **N. grossheimii** Pojark.
35. Stems 1–3, simple; leaves upright, the upper parallel to stem; calyx slightly curved, the throat scarcely oblique, the teeth subequal; inflorescence a raceme of remote pairs of semiverticels (series *Strictifoliae*). 36.
- + Stems many, strongly branching; leaves more or less horizontally spreading; calyx distinctly to strongly curved, the throat conspicuously oblique or nearly 2-lipped, the 2 lower teeth much smaller than the upper 38.
36. Leaves lanceolate or lanceolate-ovate, frequently acute or acuminate, bright green, with appressed hairs, sharply dentate; calyx 7–9 mm long 42. **N. strictifolia** Pojark.
- + Leaves ovate, mostly obtuse, crenate; calyx 6–7.5 mm long 37.
37. Stems and leaves covered with appressed minute hairs (magnifying glass!); leaves ovate or oblong-ovate; calyx covered with straight antrorse or, in lower part, spreading hairs 43. **N. alaghezi** Pojark.
- + Stems or leaves with spreading crisp hairs; leaves broadly ovate-cordate; calyx densely villous or tomentose-villous, with crisp implexed hairs 44. **N. buhsei** Pojark.
- 295 38. Uppermost calyx-tooth longer than the rest, vertically projecting; calyx-tube strongly curved, the throat nearly 2-lipped; nutlets minutely tuberculate (strong magnifying glass!), the pellucid tubercles scarcely raised above surface; inflorescence a more or less pyramidal raceme or panicle, in upper part sometimes subspicate (cycle *Heterodontae*) 39.

- + Uppermost tooth of calyx not markedly different from others, the tube not strongly curved, the throat moderately oblique; nutlets finely and unevenly foveolate-tuberculate, the tubercles not paler than the rest of the surface; inflorescence a narrow raceme 42.
39. Corolla included in calyx up to the limb 40.
- + Corolla included in calyx at most to the dilated part of tube 41.
40. Calyx long-villous or tomentose-villous; inflorescence a dense panicle, subspicate in upper part; leaves green, with rather long coarse hairs, ovate to lanceolate 34. **N. cyanea** Stev.
- + Calyx densely covered all over with short appressed or partly subappressed hairs; inflorescence a rather lax raceme or panicle; leaves grayish or yellowish with profuse short hairs, oblong or narrowly lanceolate 37. **N. biebersteiniana** (Trautv.) Pojark.
41. Leaves yellowish-green, narrowly lanceolate or oblong; calyx puberulent; axillary branches long, virgate, the lower longest, about equaling stem. 35. **N. kubanica** Pojark.
- + Leaves grayish, usually oblong-ovate; calyx villous; axillary branches subequal, much shorter than stem 36. **N. czegeensis** Pojark.
42. Inflorescence a 2-sided loose raceme, consisting of remote many-flowered semiverticels; large plants, to 150 cm high, strongly branching . . . 38. **N. grandiflora** M. B.
- + Inflorescence a more or less 1-sided raceme, consisting of remote or (near summit of stem) more or less crowded verticillasters; plants to 30-50 (80) cm high (cycle Mussinianae). 43.
43. Calyx with long white spreading hairs; stems covered with long simple spreading hairs; lower side of leaves similar but hairs subappressed; leaves to 3-4 cm long, rounded at apex; corolla pale, blue 49. **N. noraschenica** Grossh.
- + Calyx finely pubescent or arachnoid-tomentose; stems and leaves covered with short fine appressed, rarely subappressed hairs; corolla darker, violet-blue . . . 44.
44. Stems erect, 30-80 cm long, to 2.5-3 mm thick, grayish with very fine appressed hairs; inflorescence to 30 cm, lax, of 8-11 pairs of remote, 2-6-flowered semiverticels; leaves to 3.3 cm long, 2-3 cm wide, triangular-ovate 47. **N. hajastana** Grossh.
- + Stems ascending, slender, 0.7-1.5 (2) mm thick; inflorescence shorter; leaves . . . usually smaller 45.
45. Hairs on lower side of leaves grayish-velutinous, very fine (strong magnifying glass!), flexuous, implexed; flowers small; calyx (5) 6-7.5 mm long; corolla (9) 10-13 mm long 45. **N. mussinii** Spreng.
- + Indument of leaves consisting of coarser straight nonimplexed hairs, flowers larger 46.
46. Calyx 8-11.5 mm long; corolla 16-20 (22) mm long; all or at least the 3-4 upper verticillasters closely crowded at summit 48. **N. transcaucasica** Grossh.
- + Flowers smaller; calyx 6.5-9 mm long; corolla 11-14 mm long; all verticillasters distant, even the upper not confluent . . . 46. **N. reichenbachiana** Fisch. et Mey.
- 47(30). Flowers in dense spicate terminal inflorescence, this sometimes interrupted in lower part, i.e. with 1-3 (5) distant verticillasters; calyx obconical (section Spicatae) 52.

- + Flowers in distant simple or compound cymes; calyx tubular (section *Macronepeta*) 48.
- 48. Flowers in compound loose many-flowered cymes; peduncles, except the upper, much longer than cymes; corolla 14–18 (20) mm long . . . 30. **N. formosa** Kudr.
- + Flowers in mostly simple dense few-flowered cymes or semiverticels; peduncles shorter than axillary inflorescences and even shorter than flowers; corolla (17) 20–35 mm long. 49.
- 49. Leaves narrow, oblong or lanceolate, only the lowermost sometimes oblong-ovate (series *Sibiricae*) 50.
- + Leaves broad, broadly ovate or cordate (series *Gontscharovianae*) 51.
- 50. Flowers very large; calyx 9.5–14 (15) mm long; corolla 2.5–3.5 cm long; petioles of lower leaves short, 1/7 as long as blade 29. **N. sibirica** L.
- + Flowers smaller; calyx 8.5–9.5 mm long; corolla 1.7–2 cm long; petioles of lower leaves longer, 1/5–1/3 as long as blade 28. **N. manchuriensis** S. Moore.
- 51. Stems simple or in upper part with 1–3 pairs of short slender branches; leaves upright above, nearly parallel to stem, obtuse or rounded at apex; petioles 1/9–1/6 as long as blade; corolla 22–27 mm long, the narrow part of its tube exserted to the middle 31. **N. gontscharovii** Kudr.
- 297 + Stems strongly branching, the branches long, stout, branching in turn; leaves divergent, acute, petioles 1/5–2/7 as long as blade; corolla 19–24 mm long, the narrow part of its tube exserted from to 1/3 its length . . . 32. **N. consanguinea** Pojark.
- 52. Calyx with straight throat, the linear-subulate teeth about as long as tube; bracts nearly as long as calyx; flowers in narrowly cylindrical spicate inflorescence . . . 6. **N. podostachys** Benth.
- + Throat of calyx oblique, the teeth lanceolate or narrowly triangular, 1/3–1/2 as long as tube; bracts shorter than calyx 53.
- 53. All verticillasters usually in globular or ovoid-globular terminal inflorescence, sometimes 1 (2) distant; cauline leaves more or less orbicular, small, the largest to 1.5 (2) cm long and as wide (series *Supinae*) 54.
- + Upper verticillasters in cylindrical or ovoid inflorescence, the others (1) 2–5 distant; cauline leaves ovate to lanceolate-linear 58.
- 54. Hairs (best seen on inflorescence) strongly branched, the branches consisting of several cells (segments), often with secondary ramifications; narrow part of corolla-tube not exserted; plant gray-tomentose 22. **N. pamirensis** Franch.
- + Hairs unbranched or sporadically with 1–2 rudimentary (unicellular) branches; narrow part of corolla tube exserted to 1/3–1/2 its length 55.
- 55. Plant grayish or whitish, with dense tomentum on all parts; axillary branches usually short, sterile 20. **N. kokanica** Rgl.
- + Plant greenish, both leaves and inflorescence less densely hairy, not tomentose; axillary branches usually long, fertile 56.
- 56. Narrow part of corolla-tube exserted from calyx to 1/4–1/3 its length (2–3 mm); stems, petioles and leaves covered only with simple white thickish (not arachnoid) hairs; capitate sessile glands present only on calyx, bracts and sometimes upper part of stem (under inflorescence); leaves with large coarse acute teeth 21. **N. pseudokokanica** Pojark.

- 298 + Narrow part of corolla-tube twice as long as calyx; stems, petioles and leaves covered with very thin subarachnoid pellucid simple hairs and copious small whitish sessile capitate glands; leaves with obtuse teeth 57.
57. Flowers large; calyx 9–11 mm long; corolla 20–27 mm long; inflorescence many-flowered; leaves mostly cuneate at base; plants usually strongly branching 19. *N. buschii* Sosn. et Mand.
- + Flowers smaller; calyx 7–8.5 mm long; corolla 14–20 mm long; inflorescence few-flowered; leaves mostly cordate or rounded at base; plants usually few-branched 18. *N. supina* Stev.
58. Cauline leaves small, 1–2.5 (2.7) cm long; middle lobe of lower lip of corolla with entire or notched margin except for a fairly deep slit at apex (series *Densiflorae*) 62.
- + Cauline leaves large, 3.5–7 (9) cm long; middle lobe of lower lip of corolla large-toothed (series *Bucharicae*) 59.
59. Cauline leaves narrow, ovate-lanceolate or lanceolate; corolla 10–13 mm long; nutlets ca. 1.5 mm long 16. *N. alata* Lipsky.
- + Cauline leaves broad, ovate, oblong-ovate or orbicular; corolla and nutlets larger 60.
60. Stems, petioles, lower side of leaves and inflorescence covered with dense, whitish, very short, tomentose-velutinous or velutinous indument; leaves faintly appressed-crenulate to subentire 15. *N. maussarifii* Lipsky.
- + Indument not so short, not velutinous, more or less spreading, crisp, interspersed with long thin hairs, or with predominance of the latter 61.
61. Leaves orbicular-ovate; stems and lower side of leaves covered with long thin subarachnoid hairs; inflorescence with 1 distant verticillaster 17. *N. schugnanica* Lipsky.
- + Leaves oblong-ovate or ovate; stems and lower side of leaves covered with short crisp hairs interspersed with occasional long ones; inflorescence with 1–4 distant whorls 14. *N. bucharica* Lipsky.
62. Axillary branches elongate, leafy, all or most terminating in inflorescence 63.
- + Axillary branches short, slender, always sterile, often rudimentary 66.
63. Flowers small; calyx 4.5–5.3 mm long; corolla 8.5–9.5 mm long; nutlets oblong, 1.5–1.6 mm long; inflorescence a narrow spike without distant whorls; axillary branches numerous, about equaling the stem 12. *N. tyttantha* Pojark.
- + Flowers larger; calyx 7–8 mm long; corolla 16–18 mm long; nutlets large, 1.6–2.5 mm long, broad 64.
64. Cauline leaves lanceolate or oblong-ovate, with 3–4 remote teeth, green, with very short pubescence (magnifying glass!); calyx 9–12 mm long, covered with spreading not implexed hairs; inflorescence usually with 1 distant whorl; plants to 25 cm high 8. *N. transiliensis* Pojark.
- + Cauline leaves ovate, with numerous acute teeth, grayish on both sides with dense pubescence; plants higher 65.
65. All parts of plant, especially stems and calyx, with simple hairs as well as copious short capitate glandular hairs; inflorescence consisting of terminal spike and 2–4 remote verticillasters; leaves cordate or truncate at base, mostly ovate-triangular 13. *N. odorifera* Lipsky.

- + Hairs predominantly simple, interspersed with few capitate glandular hairs; inflorescence usually consisting only of an ovoid-spherical or spherical-ovoid terminal spike, 1-2 distant verticillasters infrequently occurring on main stem; leaves with cuneate base, mostly rhombic-ovate 9. **N. kokamirica** Rgl.
66. Cauline leaves lanceolate (occasionally ovate-lanceolate) with 2-4 remote teeth, some entire; calyx 8-10 mm long; corolla 15-16 mm long 7. **N. densiflora** Kar. et Kir.
- + Cauline leaves ovate or elliptic-ovate; flowers smaller 67.
67. Inflorescence usually with 3-4 (1-5) remote verticillasters; stems and leaves covered with very short simple 1-3-cellular hairs; calyx with short not implexed hairs; cauline leaves with few remote mostly recurved teeth 11. **N. pulchella** Pojark.
- + Inflorescence usually with 1 (2) remote verticillaster; stems and leaves with longer many-jointed simple hairs; calyx with long thin implexed hairs; teeth at leaf margin often not recurved 10. **N. mariae** Rgl.
- 68(1). Flowers in remote, sessile, few-flowered verticillasters; bracts (except the uppermost) to 2½-3 times as long as semiverticels, lanceolate-linear; upper lip of corolla curved at apex, with a small notch; middle lobe of under lip with flat drooping lobules 82. **N. satureioides** Boiss.
- + Inflorescence and bracts different, upper lip of corolla not curved at apex, cleft for 1/3-3/4 its length; middle lobe of lower lip concave, the lobules with upturned margins 69.
- 300 69. Calyx straight, with nearly straight throat, the teeth upright, straight, equal or nearly so; middle lobe of lower lip of corolla directed upward, with basal swelling; nutlets smooth, lustrous; floral leaves not shorter than calyx of flowers of the cymes or semiverticels which they subtend, usually much longer, mostly broad, petiolate (section *Micronepeta*) 70.
- + Calyx curved or straight, with oblique or 2-lipped throat; lower 2 teeth much shorter and narrower than the upper, all teeth except the uppermost curved forward; middle lobe of lower lip of corolla downturned, smooth, without swelling; nutlets tuberculate or granular; floral leaves and bracts small, narrow, shorter than calyx, not petiolate (section *Micranthae*) 75.
70. Cauline and floral leaves oblate, reniform or semiorbicular (occasionally ovate-rhombic); bracts subtending semiverticels foliaceous, spatulate or lanceolate-spatulate, tapering to long petiole. 78. **N. spathulifera** Benth.
- + Cauline and floral leaves ovate or lanceolate; leaves subtending semiverticels or cymes of a different shape, tapering to short petiole 71.
71. Inflorescence consisting of terminal head and several pairs of distant cymes; leaves subtending cymes and bracts (often also floral leaves) rigid, with thick nerves, spinescent; calyx-teeth separated by narrow sinus; lobes of upper lip of corolla short, semiorbicular (series *Pungentes*). 72.
- + Inflorescence consisting of terminal head and sometimes 1 (rarely 2) verticillasters; leaves subtending semiverticels not rigid, not spinescent, ovate or lanceolate-linear; calyx-teeth separated by rounded sinus; lobes of upper lip oblong-ovate (series *Bracteatae*) 74.

72. Terminal head formed by 1-2 pairs of cymes, lax, 5-10 (13)-flowered; all cymes below it with peduncles (1) 2-5.5 cm long. 81. *N. microcephala* Pojark.
- + Terminal head formed by 3-4 pairs of cymes, compact, (12) 16-30-flowered; 2 or 3 (rarely 1) pairs of remote cymes sessile or subsessile, the others with peduncles 1-2 cm or 2-6 cm long. 73.
- 301 73. Calyx, bracts, lower side of leaves and upper part of stems covered with simple hairs and smaller short-stipitate or sessile glands; floral leaves subtending the terminal head not exceeding its width (usually about equaling bracts), rigid, curved, always spinescent. 79. *N. pungens* (Bge.) Benth.
- + Calyx, bracts, lower side of leaves and stem covered only with simple soft hairs; floral leaves subtending the terminal head exceeding its width, usually leaflike, flat, not curved and often not spinescent. 80. *N. fedtschenkoii* Pojark.
74. Cauline and floral leaves ovate, toothed; leaves subtending semiverticels large (to 1 cm long), ovate, entire, forming, together with floral leaves, a kind of involucre around the head 76. *N. bracteata* Benth.
- + Cauline and floral leaves lanceolate-linear or linear, few-toothed or entire; leaves subtending semiverticels to 7 cm long, narrow, ovate-oblong or narrowly elliptic, entire, not involucre 77. *N. daëniensis* Boiss.
75. Flowers medium-sized; calyx 6.5-9 mm long; corolla 11-15 mm long; nutlets coarsely tuberculate (series *Amoenae*) 76.
- + Flowers small; calyx 3.5-8.5 mm long; corolla 3.8-9.5 mm long 77.
76. Upper cymes loosely approximate (not forming a compact spicate inflorescence), the others sparse, all usually loosely dichotomous, with peduncles 3-9 cm long; leaves subtending cymes and bracts linear-spatulate or linear-oblong 50. *N. amoena* Staf.
- + Upper cymes crowded in a dense spicate inflorescence, the others compact, only the lowermost sometimes dichotomous, with peduncles 1-4 cm long; leaves subtending cymes and bracts narrowly linear 51. *N. troitzkii* Sosn.
77. Flowers in remote pedunculate cymes; calyx curved, with 2-lipped throat (series *Micranthae*) 78.
- + Inflorescence consisting of a terminal many-flowered spicate terminal head and sometimes 1 (2) pairs of distant sessile semiverticels; calyx straight, with oblique throat (series *Ispahanicae*) 81.
78. Corolla included in calyx up to limb; uppermost tooth of calyx mostly half as long and sometimes as long as upper lip of corolla; flowers very small; calyx 3.6-5 (6.5) mm long; corolla 3-8 mm long 79.
- 302 + Corolla more exserted, the limb and the dilated part of tube not included in calyx; flowers larger; calyx (4) 5.5-8.5 mm long; corolla 7.5-9.5 mm long 80.
79. Cymes rather loose, mostly loosely dichotomous, the axes of the first order 8-13 mm long; general inflorescence loosely racemiform or paniculate; leaves thin, chartaceous, sparsely covered with simple hairs and sometimes with few glandular hairs 52. *N. micrantha* Bge.
- + Cymes dense, often forming a globular head, sometimes only the lower dichotomous, the axes of the first order not exceeding 2-3 mm; aggregate inflorescence a compact raceme; leaves firm, densely covered with capitate glandular hairs intermixed with simple ones 54. *N. pallida* C. Koch.

80. Stems, leaves and axial parts of inflorescence with powdery indument of very small capitate glandular hairs; cymes lax, 3-8-flowered, mostly loosely dichotomous (axes elongate); leaves thin, chartaceous, the veins not prominent 55. *N. saccharata* Bge.
- + Stems, leaves and axial parts of inflorescence grayish, densely covered with simple jointed hairs; cymes compact, 6-12 (16)-flowered, only the lower sometimes dichotomous 53. *N. meyeri* Benth.
81. Stems, petioles and part of inflorescence densely beset with simple hairs and short-stipitate glands; fruiting calyx submembranous; middle lobe of lower lip of corolla entire; bracts straight, upright 56. *N. ispahanica* Boiss.
- + Short-stipitate glands absent, indument of simple hairs only; calyx indurated in fruit; middle lobe of lower lip of corolla large-toothed; bracts arcuately curved. 57. *N. santoana* M. Pop.

Section 1. **Glechomanthe** Pojark. sect. nov. in Addenda XIX, 353. — Calyx with oblique or 2-lipped throat; corolla with long tube, gradually and rather weakly dilated above; middle lobe of lower lip more or less horizontal, flat without swelling at base, gradually tapering to broad base or with rather long broad claw; lateral lobes large, elongate, ovate, nearly as long as upper lip and as wide as its lobes; lower stamens generally much shorter than the upper, with anthers at throat level or even somewhat concealed in tube, rarely slightly shorter than the upper; flowers in remote few-flowered cymes or in a terminal capitate inflorescence. Perennial plants.

303 Type of section — *N. longibracteata* Benth.

Note. In the structure of reproductive organs, the species of the section *Glechomanthe* do not differ substantially from those segregated in the genus *Glechoma* that differ conspicuously in habit. Particularly noteworthy is the similarity in the structure of the corolla, that finds expression in a complex of characteristic details which can be observed separately, or in combination with other characters, in the flowers of certain *Nepeta* species. Some of the features common to the *Glechomanthe* section of *Nepeta* and *Glechoma* are: 1) shape of the corolla-tube; 2) elongate lateral lobes of lower lip; 3) shape and small size of its middle lobe. In two subsections, *Callistegia* and *Brachystegia*, the structure of the androecium is the same as in *Glechoma*. Among species in the subsection *Catantherae* the androecium is structurally of the type characteristic for nearly all species of *Nepeta*. By way of this subsection, the section *Glechomanthe* links up with the most closely allied sections *Macronepeta* and *Spicatae*. The section *Glechomanthe* almost obliterates the boundary between the genus *Nepeta* and the genus *Glechoma* and compels a reexamination of the relationship between them, taking into account all their morphological and anatomical* features.

* O. F. Bilimovich (Tr. Voronezhsk. Gos. univ., VII, Bot. otd. 1935) found striking differences in the structure of the pericarp of the nutlets of *Glechoma hederacea* L. and three species of *Nepeta* which she investigated. However, since the latter belongs to closely allied sections (*Cataria* and *Orthonepeta*), no generalized conclusions can as yet be drawn from this work.

Subsection 1. *Callistegiae* Pojark. subsect. nov. in Addenda XIX, 353. — Flowers in large dense terminal heads formed by crowded verticillasters; floral leaves resembling the cauline; leaves subtending verticillasters and bracts numerous, longer than flowers, suffused with violet; calyx obconical, with very oblique nearly 2-lipped throat; lower stamens much shorter than the upper, with anthers at the level of throat; anther-cells divergent at nearly a right angle; nutlets smooth. Low alpine plants; leaves cuneate, with undulate, deeply crenate margin; stems many, the aerial parts densely beset with squamiform leaves.

Type of subsection — *N. longibracteata* Benth.

This subsection contains two closely related species which constitute the natural phylogenetic series *Longibracteatae* Pojark.

1. *N. longibracteata* Benth. Lab. gen. et sp. (1834) 737; in DC. Prodr. XII, 392; Hook. Fl. Brit. Ind. IV, 660; Lipskii in Tr. Bot. sada, XXVI, 572, p. p. (excl. var. *latebracteata* Lipsky); O. and B. Fedch. Perech. Rast. Turk. V, 142. — *Glechoma longibracteata* Ktze. Rev. gen. (1891) 518. — **lc.**: Jacquem. Voy. Ind. Bot. tab. 137.

Perennial; root woody, knotty, branching in upper part, passing into short rhizome, splitting longitudinally below into coarse fibers; stems 8–12 cm long, 1–1.5 mm across, weak, precumbent with remote lower (underground) internodes, branching, often whitish in upper part with long fine jointed hairs, in lower part with sparser short hairs and small whitish glands, often reddening; axillary branches developed, often terminating in inflorescence; leaves at 2–3 lower nodes brownish, squamiform, linear-lanceolate, sessile; other cauline leaves 0.8–1.5 mm long, 0.5–1.2 mm wide, long-petioled, obovate-cuneate, ovate-rhombic or ovate, with cuneate or truncate-cuneate base, coarsely crenate-incised, the upper sometimes 3-lobed, rather densely covered on both sides with soft long fine hairs; leaves subtending the head similar to cauline, those subtending the lower semiverticels cuneate, colored or sometimes green, the others bracteiform; inflorescence usually globular, rarely somewhat elongate, 1.5–3 (3.5) cm long; bracts linear or narrowly linear, much longer than flowers (to 17–19 mm long, 0.5–0.6 mm wide), violet, densely beset at margin with long simple hairs and outside with small glandular ones; pedicels 1–1.5 mm long; calyx straight, narrowly obconical, 7–8 mm long, 1.6–2.5 mm wide, with strongly oblique throat; teeth narrow, lanceolate-triangular, long-acuminate, the lower slightly narrower than the upper and slightly longer than calyx-tube, the upper as long as tube or nearly so, all teeth, like nerves of tube, densely covered with simple long fine hairs and outside with very small glands; corolla azure, finely pubescent outside, 15–18 mm long; tube 9–11 mm long, slender, curved, gradually dilated above, exerted for nearly 1/3 its length; upper lip concave, cleft to the middle or slightly less, the lobes broad, obtuse or subtruncate, sometimes crenulate at apex; lower lip much larger, the middle lobe oblate, short-clawed, broadly emarginate at apex, with remotely and coarsely crenate margin, whitish in middle part, with large blue spots, the lateral lobes obovate; upper stamens and style slightly shorter than upper lip. Fl. July–August.

Alpine mountain belt, on sliding stony taluses. — Centr. Asia: Pam.-Al. (E. Pamir).

Gen. distr.: Ind.-Him. (Kashmir) and Dzu.-Kash. (area adjacent to Pamir). Described from N. Himalaya, Kan-Ran-Gkhan-Ti, from the Jacquemont specimen. Type in Paris.

- 305 2. *N. lipskyi* Kudr. in Bot. mat. gerb. Inst. bot. i zool. AN UzSSR, IX (1947) 20. —

Dracocephalum kokanicum Rgl. in Izv. Obshch. lyub. est. antr. i etn. XXXIV, 2 (1882) 66; O. Fedch., *ibid*, CIII, 24 (1902) 121. — *N. longebracteata* var. *latebracteata* Lipsky in Tr. Bot. sada, XXVI (1909) 572. — *Glechoma lipskyi* Pojark. nom. altern.

Perennial; stems 5–10 cm long; root long, robust, vertical, splitting into fibers, branching above, the underground perennial parts of stems slender, often elongate, branching; stems numerous, ascending, white-pubescent, often red in lower part, 1–1.5 mm across, with short sterile axillary branches; leaves at 2–3 lower nodes brownish, squamiform; other cauline leaves green, softly grayish-pubescent on both sides, the lower side with denser pubescence and often copiously punctate-glandular, obovate-cuneate or rhombic-ovate, rarely ovate, 1–1.5 (2) mm long, 0.7–1.2 mm wide, usually tapering to short petiole, the margin largely crenate or nearly incised in upper part; semiverticels sessile, forming a compact many-flowered capitate globose inflorescence 2–5 cm long and as broad; leaves subtending inflorescence green or violet but not differing from cauline leaves in size or shape; leaves subtending semiverticels lanceolate-elliptic or obovate-cuneate, long-tapering toward base, acute at apex, with large acute teeth, covered outside, like bracts, with very small capitate glands interspersed with few punctate glands and fringed with long white jointed hairs; bracts as long as or slightly longer than flowers, linear-lanceolate, long-acuminate, violet; pedicels 1–1.5 mm long; calyx 9–12 mm long, straight, with strongly oblique throat, violet or more or less greenish, finely glandular outside; teeth narrowly lanceolate, long-acuminate, at margin long-ciliate, subequal or the two lower slightly longer, the three upper (1/2) 2/3 as long as tube, the two lower nearly as long; corolla 18–22 mm long, glandular outside, the tube long, exerted from calyx for approximately 3 mm, gradually passing into narrow neck 4–5 mm long, 3–3.5 mm wide; upper lip deeply cleft into suborbicular lobes; lower lip with large middle lobe (ca. 4 mm long, 6 mm wide) and rounded-tetragonal recurved lateral lobes ca. 2 mm long, 2.5 mm wide; nutlets brown, broadly ellipsoid, 2–2.5 mm long, 1.25 mm wide. Fl. July–August; fr. from end of July. (Plate XIX, Figure 1.)

Taluses in alpine and subalpine belts. — Centr. Asia: Pam.-Al. (Alai, Turkestan and Gissar ranges). Endemic. Described from Dzhiptyk pass in Alai Range. Type in Leningrad.

- 306 Subsection 2. *Brachystegiae* Pojark. subsect. nov. in Addenda XIX, 353. — Flowers in remote 1–5-flowered semiverticels; floral leaves resembling cauline leaves but the uppermost much smaller; bracts lanceolate, half as long as calyx; calyx obconical, with oblique throat; lower stamens much shorter than the upper; anthers diverging at nearly a right angle, at throat level or slightly lower; nutlets rugulose, pointed at apex. Perennial plants, with strongly thickened woody rhizome and sessile leaves. One species.

Type of subsection — *N. glutinosa* Benth.

3. *N. glutinosa* Benth. Lab. gen. et sp. (1834) 735; id in DC. Prodr. XII, 377; Hook. Fl. Brit. Ind. IV, 660. — *N. badamdarica* Lipsky in Tr. Bot. sada, XXVI (1909) 574; O. and B. Fedch. Perech. rast. Turk. V, 141. — *Glechoma glutinosa* Pojark. in sched.

Perennial, forming large tufts, 40–70 (and probably more) cm high, with strong ladanium odor; root sturdy, to 2–3 cm across, often twisted or bent, woody, splitting at end



PLATE XIX. 1 – *Nepeta lipskyi* Kudr., general aspect, flower, nutlet in ventral and dorsal view; 2 – *N. glutinosa* Benth., general aspect, flower, nutlet in dorsal view; 3 – *N. knorringiana* Pojark., general aspect, flower, nutlet in ventral view; 4 – *N. subhastata* Rgl., side view of calyx.

into fibers, passing into rhizome at the top, densely covered all over with imbricated brown squamiform lanceolate or ovate nerved and toothed leaves 0.8–1.8 cm long; stems strong, to 4–5 mm thick, erect or slightly ascending, rarely branching, covered below with imbricated leaves squamiform, densely leafy above, with long glandular hairs and numerous sessile glands; axillary branches slender, partly short, sterile, and partly elongate, floriferous; all leaves sessile, with broad semiamplexicaul base, the lower brownish, others pale green, viscous with a usually dense cover of long glandular hairs intermixed with sessile glands, the middle largest, 1.3–3 cm long, 0.8–2.2 cm wide, cordate-ovate, the upper ovate, all acute; the veins coarse, impressed above, very prominent beneath, terminating in unequal teeth (large usually alternating with small), all acute, mostly curved; flowers in (2) 4–5-flowered semiverticels in axils of 4–8 upper pairs of leaves, the lower on peduncles 3–5 (10) mm long, remote, the upper subsessile, approximate, sometimes almost confluent; all leaves subtending inflorescence resembling the cauline but the upper smaller, sometimes
309 shorter than calyx, ovate, lanceolate or obovate-lanceolate, with few small teeth; pedicels 1–2.5 mm long; bracts and leaves subtending semiverticels narrowly lanceolate to linear, nerved, approximately half as long as calyx; calyx 8–12 mm long, 2–3 mm wide, erect, obconical, with (13) 15 very prominent thick nerves, like other parts of inflorescence (except corolla) densely covered with sessile glands and jointed (2–8-celled) glandular hairs; throat oblique; teeth ovate-triangular to lanceolate-triangular, the upper $1/4$ – $1/3$ as long as tube, the lower slightly longer and narrower, $1/3$ – $2/5$ as long as tube; corolla bluish or azure, glandular, sparsely so outside, most copiously on limb, 18–22 mm long, twice the length of calyx, the long slender tube much exerted and gradually expanding into limb, not forming any distinct neck; upper lip erect, 2.5–3 mm long, cleft to slightly below middle into obtuse lobes, ca. 2 mm wide; lower lip half as long again as the upper, its middle lobe reniform, ca. 2.5 mm long, 4–5 mm wide, coarsely crenate-incised, the lateral lobes similar to lobes of upper lip in size and shape; stamens with anthers diverging at nearly a right angle, the upper $2/3$ as long as upper lip; lower stamens much shorter, barely reaching the base of upper lip, with slightly smaller anthers; style nearly equaling the upper lip; individuals occur with only female flowers in which the rudiments of the stamens are included in the tube; nutlets ellipsoid, tapering at both ends, pointed at apex, greenish-brown to cinnamon-brown, transversely rugulose, 2–3 mm long, 1–1.3 mm wide. Fl. July–August; fr. from August. (Plate XIX, Figure 2.)

Alpine belt, 3500–4200 m in steppe plant communities. — Centr. Asia: Pam.-Al. (W. Pamir, south only in Bakhan). **Gen. distr.:** Iran (northeast Afghanistan), Ind.-Him. (Kashmir), Dzu.-Kash. (western part). Described from NW Himalayas. Type in Paris.

Note. In one of the herbarium specimens, some female flowers were observed in which stamens were included in the corolla-tube and had very small sterile anthers.

Subsection 3. *Catantherae* Pojark. subsect. nov. in Addenda XIX, 353. — Flowers in remote cymes or semiverticels; floral leaves resembling the cauline leaves but the upper much smaller; bracts lanceolate-subulate, much shorter than calyx; calyx tubular or tubular-obconical, with oblique or 2-lipped throat; lower stamens slightly shorter than the upper, with anthers diverging at an angle of 180° , lying under flat upper lip; nutlets finely papillose. The subsection comprises two Central Asian species.

Type of subsection — *N. knorringiana* Pojark.

310 4. *N. knorringiana* Pojark. sp. nov. in Addenda XIX, 353.

Perennial; plant with oblique rhizome, ca. 1 cm across, covered with remnants of blackish-brown squamiform leaves; stems 13–25 cm long, 0.7–1.3 mm thick, suberect, simple, densely leafy, with internodes to 3.5–4 cm long, covered with fine spreading white simple jointed hairs; leaves firm, glaucescent, densely covered on both sides with flat yellow resinous glands and fine simple hairs, very sparsely so above, rather densely beneath, especially along nerves where intermixed with few capitate sessile whitish glands, triangular-ovate, with cordate base or the upper with truncate base, obtuse or rarely acuminate at apex, along margin with 4–5 large triangular mostly acute teeth, the middle ones largest, to 1.3–2 cm long, 1.1–1.6 cm wide; lower floral leaves resembling cauline leaves, others smaller, ovate or rhombic-ovate, acute, toothed; semiverticels 2–5 pairs, 2–5-flowered, 1–2 pairs remote, other 2–3 pairs (or rarely all) loosely approximate at summit but not forming a head; peduncles 3–5 mm, the lower to 8–10 mm long; pedicels 0.5–1.5 mm long; leaves subtending semiverticels and bracts linear-subulate, plicate, puberulent; bracts 1/3–2/7 as long as calyx; calyx 8–9 mm long, violet, 15-nerved, covered with fine simple spreading 3–5-jointed hairs sometimes interspersed with few sessile capitate glands, tubular, with oblique throat; teeth lanceolate, gradually acuminate, straight, subequal, 2.25–2.7 (3) mm long, the upper 2/5, the lower 1/2 times as long as tube; corolla 20–24 mm long, sparingly pubescent outside (with traces of bright pink on lips); tube about twice the length of calyx, slightly curved above; upper lip 3–4 mm long, cleft to 1/3 into obtuse lobes 2–2.2 mm wide; middle lobe of lower lip cuneate-flabelliform, 3.5–4.5 mm long, 4–5.5 mm wide, gradually tapering from middle to wide base, emarginate and obscurely crenulate at apex, the lateral lobes ovate, 2.5–3 mm long, 1.7–2.5 mm wide; upper stamens and style equaling the upper corolla-lip, lower stamens slightly shorter; anthers broadly elliptic; nutlets 1.6–1.8 mm long, 0.7 mm wide, narrowly ellipsoid, 3-angled, with a rib on ventral side, pointed at apex, brown, densely papillose at apex, sparsely elsewhere. Fl. and fr. last half of June. (Plate XIX, Figure 3.)

Stony slopes in high-mountain belt. — Centr. Asia: Pam.-Al. (eastern part of Alai Range). Endemic. Described from Tara River, tributary of Kara-Kul'dzha River. Type in Leningrad.

311 5. *N. subhastata* Rgl. in Izv. Obshch. lyub. est. antr. i etn. XXXIV, 2 (1882) 64; O. and B. Fedch. Perech. rast. Turk. V, 143.

Perennial, sometimes almost suffrutescent; root thick, to 1 cm across, woody, more or less twisted, splitting at the end into fibers, passing at the top into a thick tough short rhizome bearing remnants of old stems; stems 8–25 cm long, ascending, slightly curved, slender, 0.8–1.5 mm across, with internodes 2.5–5 cm long, not branching, leafy all over, scabrous, densely covered (especially in upper part) with very short 1–2 (3)-cellular simple spreading hairs intermixed with small sessile glands; leaves pale, glaucescent-green, densely beset beneath (at first also above) with very short hairs and sparse yellow punctate aromatic glands, ovate, acute or obtuse, with cordate or sometimes deeply notched base (in upper leaves cuneate), the margin with large obtuse or rarely acute teeth; leaves on middle part of stem largest, 1.3–2 cm long, 1–1.8 cm wide; petioles of cauline leaves 1/6–1/3 as long as blade, with indument as on stems; lower floral leaves resembling the cauline but sessile, others small, 0.7–1.2 mm long, 0.3–0.4 mm wide, elliptic, finely toothed or entire;

flowers in dense few-flowered semiverticels, these (except 1, rarely 2) crowded near summit to form a loose head 3–4 cm long (without corollas); upper peduncles 2–5 mm, the lower to 1 cm long; bracts $1/3$ – $2/5$ as long as calyx; bracts and leaves subtending semiverticels lanceolate to linear, with minute hairs, the margin ciliolate; pedicels 0.5–1.7 mm long; calyx 7.5–9 mm long, narrowly obconical, in fruit subcampanulate, 13-nerved, with nearly 2-lipped throat, densely covered with short thick spreading hairs more or less interspersed with sessile capitate white glands; teeth lanceolate, abruptly terminating in a long recurved point, the 3 upper $2/5$ – $1/2$ as long as, the 2 upper [should be lower] about equaling, the tube; corolla 18–23 mm long, sparsely hairy outside, the tube slightly curved, exserted 5–7 mm from calyx, gradually expanding toward limb; upper lip erect, 3–4 mm long, cleft to $1/4$ – $1/3$ into 2 broad obtuse lobes; lower lip almost twice as long as the upper, its middle lobe cuneate-flabelliform, 4.5–5 mm long, 5–5.5 mm wide, gradually tapering to short claw, coarsely crenate, rather deeply emarginate, the lateral lobes ovate, 2.5–3.3 mm long, 2–3 mm wide; upper stamens and style about equaling the upper lip; 312 lower stamens reaching the middle of upper lip; nutlets ellipsoid, 3-angled, 2.5 mm long, 0.8 mm wide, pale brown, unevenly and finely plicate, minutely tuberculate. Fl. June; fr. toward last half of July. (Plate XIX, Figure 4.)

Stony slopes in high-mountain belt. — Centr. Asia: Pam.-Al. (eastern part of Turkestan Range and western part of Alai Range). Described from northern slope of Turkestan Range, Chichikta on Chiburgan River. Type in Leningrad.

Note. This unique species was first described from the incomplete collections of O. Fedchenko (without flowers) from the upper reaches of the Isfara River; it was only much later that flowering specimens were collected on Alai Range (Kutban-Kul lake) and made it possible to establish its taxonomic position.

Section 2. **Spicatae** (Benth.) Pojark. comb. nov. — Sect. *Pycnonepeta* § *Spicatae* Benth. in DC. Prodr. XII (1848) 371. — Sect. *Eunepeta* § *Spicatae* Boiss. Fl. or. IV (1879) 637; Briq. in Pflanzenfam. IV, 3a, 236. — Flowers in verticillasters forming a dense spicate terminal inflorescence, this sometimes interrupted in lower part (i. e. 1–3 (5) lower verticillasters remote); bracts linear-subulate; calyx obconical, mostly slightly gibbous dorsally, with straight or oblique, sometimes 2-lipped throat; corolla medium-sized, the curved tube abruptly expanding into large neck; middle lobe of lower lip with swelling at center, tapering from broad base, with horizontal or slightly drooping lobules; nutlets smooth. Perennial plants.

This section is most diversified and most widely represented in the western Himalayas; a large number of species occur in Central Asia and Afghanistan, but very few in Iran. Two grow in the Caucasus.

Series 1. *Podostachydes* Pojark. — The upper or all verticillasters forming an oblong cylindrical spicate inflorescence; calyx with straight throat and subequal linear-subulate teeth; narrow part of corolla-tube completely included in calyx or barely exserted; middle lobe of lower lip of corolla entire; bracts equaling or exceeding calyx; nutlets lustrous.

In addition to *N. podostachys* distributed in Central Asia, this series contains *N. kandagarica* Kudr. (SE Afghanistan) and *N. assurgens* Hausskn. et Bornm. (SE Iran).

6. *N. podostachys* Benth. in DC. Prodr. XII (1848) 372; Boiss. Fl. or. IV, 639; Franch. Pl. Turkest. 137; Lipsk. in Tr. Bot. sada, XVIII, 95; O. and B. Fedch. Perech. rast. Turk. V, 139. — *N. maracandia* Bge. in Mém. div. sav. Ac. Sc. Pétersb. VII (1851) 434; Boiss. Fl. or. IV, 640. — *N. paulseni* Briq. in Bot. Tidsskr. 28 (1908) 235. — **lc.**: Briq. l. c. fig. 2, in Tr. Sredneaz. n.-i. opytn. st. efiro-masl. rast. 1 (1932) Fig. 39.

Perennial; root woody, coarsely fibrous, more or less twisted, longitudinally splitting, passing above into more or less branching rhizome; stems many, 30–50 (70) cm high, indurulent at base and beset with squamiform leaves, arcuately ascending to suberect, slender, subterete, sparsely puberulent, in lower part subglabrous, with very distant upper internodes, branching; lower branches short, rudimentary, sterile, the upper leafy, fertile and developing short sterile branches; leaves thin, more or less densely covered with basally thickened spreading simple hairs, sometimes subglabrous; cauline leaves lanceolate or oblong, small, to 2.5 cm long, 0.8 cm wide, acuminate, gradually tapering to slender petiole, rarely (mainly the lower) ovate-lanceolate to triangular-ovate, with rounded-cuneate or subtruncate base, each margin with 2–4 remote teeth, these acute or obtuse, patent, often large, almost lobelike; inflorescence dense, compact, oblong-cylindrical, to 9 cm long, 1.6 cm wide, the lower 1–2 (3) verticillasters sometimes distant; floral leaves lanceolate or oblong-elliptic, mucronate, entire, the upper bractiform, mostly slightly shorter, rarely slightly longer than calyx, linear-subulate, very finely point-tipped but not spinescent; pedicels 0.75–2 mm long; calyx 5–8 mm long, narrowly obconical, 15-nerved, densely covered like bracts, with short-stipitate capitate glands and, on the nerves, with simple many-jointed hairs, the throat straight, the teeth long-acuminate from lanceolate base, the upper slightly longer than the lower, equaling or slightly exceeding the tube; all teeth, as well as bracts, ciliate or villous at margin, with long implexed pellucid many-jointed hairs; corolla 8.5–11 mm long, sparsely puberulent outside; tube barely exceeding calyx-teeth, slender, curved, abruptly expanding into a broad neck, 1–2 mm long, 1.8–2.5 mm wide; upper lip 1.7–2 mm long, erect, cleft to middle into oblong-ovate lobes, the middle lobe 2–2.5 mm long, 2.5–3.5 mm wide, cordate, strongly bulging at center especially near base, with entire margins, the lateral lobes semiorbicular-triangular, 0.7–1 mm long, 1.5–2 mm wide; upper stamens as long as upper lip of corolla; style slightly exerted; nutlets black, lustrous, ellipsoid, 1.4–1.6 mm long, 0.8–1 mm wide. Fl. end of June to first half of September; fr. from July.

- 314 Upper zone of wood and scrub belt; juniper groves, rosariums, in alpine belt in meadows and steppe coenoses, open stony and gravelly slopes. — Centr. Asia: Pam.-Al. **Gen. distr.**: Iran (eastern part — E. Afghanistan) and Ind.-Him. (southwestern part — Kashmir). Described from Afghanistan, mountains near Kabul. Type in Kew.

Note. This polymorphous species has an extensive distribution area, but it has not been possible to discern any geographical pattern in its variability. Consequently, neither *N. maracandia* Bge. (type from vicinity of Samarkand) nor *N. paulseni* Briq. (type from Yashil'-Kul' lake in Pamir) has been recognized as an independent species. Most distinctly diverging from the type, and possibly deserving of attention, is a form distributed in the rosarium belt in the western part of the Darvaz area which is particularly conspicuous because of its height (more than 1 m) and the large size of all parts, including inflorescence and flowers.

Economic importance. The essential oil of this plant has a pleasant odor and may be used in the perfume industry, but the yield does not exceed 0.04%.

Series 2. *Densiflorae* Pojark. — Upper or all verticillasters in cylindrical or ovoid spike inflorescence; calyx-throat oblique, the teeth lanceolate, rarely lanceolate-triangular, (2/3) 1/2–2/5 as long as tube; corolla with tube included in calyx to base of neck (rarely slightly less), the middle lobe of under lip entire or scarcely emarginate; bracts much shorter than calyx; nutlets dull; cauline leaves small, to 10–25 (30) mm long.

This series is nearly endemic to the upper mountain belt of Central Asia; only one species grows beyond its range, in southwestern Altai.

7. *N. densiflora* Kar. et Kir. in Bull. Soc. nat. Mosc. XIV (1841) 725; Ldb. Fl. Ross. III, 373; Benth. in DC. Prodr. XII, 372; Kryl. Fl. Zap. Sib. IX, 2313. — *N. saposhnikowii* Nik. et Plotn. in Bot. mat. gerb. Bot. sada, VI, 1 (1926) 20.

315 Perennial, rhizome slender, creeping, branching at end, covered at nodes, like the lower part of stems, with dark brown squamiform leaves; stems to 25–35 cm long, ascending at base, erect above, 1.5–2.25 mm thick, with internodes 5–6 cm long, covered more sparsely in lower part, with spreading crisp simple hairs interspersed with very small glandular hairs; axillary branches slender, always sterile, the lower with 4–7 pairs of leaves and developed internodes, the upper mostly rudimentary, short; leaves bright green, sparsely covered on both sides with short simple hairs interspersed, more copiously beneath, with minute glandular hairs and punctate yellow oil glands; cauline leaves 15–30 mm long, 2–10 mm wide, lanceolate or rarely some oblong-ovate, gradually acuminate from cuneate or rounded-cuneate base, usually entire in lower part, with 1–4 small distant antrorse teeth mostly near apex; lower leaves with petioles 2–4 mm long, others sessile; leaves of sterile lateral branches smaller and narrower, oblong-elliptic or lanceolate-linear, often obscurely toothed or entire; pedicels 0.5–1.25 mm long; inflorescence in flower ovoid or oblong-ovoid, usually with 1 remote verticillaster, rarely without it, subtended by small lanceolate green or more or less colored terminal leaves; bracts bluish-violet, lanceolate-linear, long-acuminate, 7–11 mm long, not exceeding calyx, densely covered with very small glandular hairs intermixed with long simple hairs, these forming a dense fringe along the margin; calyx bluish-violet, 8–10 mm long, covered outside, especially on nerves, with long hairs and densely beset with very small glandular ones, the throat oblique; teeth narrowly triangular, long-acuminate, the upper and lower similar in shape, the 2 lower sometimes 0.5–1 mm shorter, the upper ca. 1/2–2/3 as long as tube; corolla pubescent outside, blue, 15–16 mm long, its tube as long as calyx; upper lip 3 mm long, cleft to middle or often for 2/3 into 2 obtuse lobes, 2–2.5 mm wide; middle lobe of lower lip 3–4 mm long, (6.5) 7–8 mm wide, with deep and broad notch at middle, the lateral lobes semiorbicular-triangular, 0.75–1 (1.5) mm long, 2.3–3 mm wide; upper stamens slightly exceeding upper lip; nutlets dark brown, broadly ovoid, 2 mm long, 1–1.25 mm wide. August.

Alpine belt, in stony places. — West Siberia: Alt. (southwestern part only — Naryn Range, Kaba region). **Gen. distr.:** Mong. (Mongolian Altai). Described from Naryn Range, Dzhaiddak River. Type in Leningrad.

8. *N. transiliensis* Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 286.

Perennial; root knotty, vertical or ascending, longitudinally splitting into coarse fibrous sections, branching at the top, passing into a short multicapital rhizome; stems 20–30 cm long, 1.5–3 mm across, ascending, often slightly arched, with internodes to 5 mm long,

316 branching from base, crisp-hairy, the hairs short, simple, jointed and interspersed with smaller sessile glandular hairs; axillary branches (except for 1-2 uppermost pairs) elongate, with 6-7 developed internodes, usually terminating in inflorescence, this in turn producing short axillary branches; leaves and stems densely covered with short simple glandular hairs intermixed with punctate yellow glands; basal leaves squamiform, brown, amplexicaul; cauline leaves 1.5-2.3 cm long, 0.5-0.8 cm wide, oblong-ovate to lanceolate, gradually acuminate above, with narrowly cuneate base, the margins toothed nearly from base, the teeth few, equidistant, acute, patent; lower leaves short-petioled, the upper sessile; leaves of axillary branches smaller and narrower; floral leaves linear-lanceolate, green, sessile; semiverticels sessile, forming a terminal oblong ovate or subcylindrical inflorescence, this 4-7 cm long on main stem and usually accompanied by 1 more or less remote verticillaster; bracts lanceolate, 5-7 mm long, always shorter than calyx and, like the latter, blue-violet, covered with short scablike glandular hairs and spreading jointed simple hairs, the margin ciliate; pedicels 0.5-1 mm long; calyx 9-12 mm long, 3.5-4 mm wide; teeth oblong-triangular, acuminate, the upper 2.5-3.5 mm long, (2/7) 1/3-1/2 as long as tube, the lower sometimes slightly shorter and narrower than the upper; corolla (violet-blue?) 17-18 mm long, pubescent outside, the curved tube as long as calyx or slightly (0.5-0.75 mm) exserted; upper lip 3-3.5 mm long, cleft to 2/3 into obtuse broad lobes, 2.3-2.5 mm broad; middle lobe of lower lip on stipe 0.6-0.8 mm long, 4 mm long, 7-8 mm wide, the lateral lobes 0.7-1 mm long, 2.7-3 mm wide; upper stamens and style slightly exceeding upper lip; nutlets elongate-ovoid, 2.5-3 mm long, 1-1.2 mm wide, brown. Fl. from July; fr. September.

Stony places, rock crevices in alpine belt. — Centr. Asia: T. Sh. (eastern part of Zailiisk Ala-Tau). Endemic. Described from Karach Range, upper reaches of Turgun' River. Type in Leningrad.

Note. Very similar to *N. densiflora* in habit but easily distinguished by various characters outlined in the key.

9. *N. kokamirica* Rgl. in Tr. Bot. sada, VI (1879) 358; O. and B. Fedch. Perech. rast. Turk. V, 141. — Ic.: Gartenflora, XXIX, tab. 1030.

317 Perennial; root knotty, splitting, passing into branching rhizome, this, like lower part of stem, covered with brown squamiform leaves; stems numerous, ascending or decumbent in lower part, 15-50 cm long, 1.5-3 mm thick, with internodes to 7 cm long, grayish, densely covered with crisp spreading jointed simple hairs interspersed with few very short glandular hairs; axillary branches numerous, often equaling stem, with long internodes, branching, many terminating in inflorescence; leaves densely grayish-tomentose on both sides, small; cauline leaves to 17 mm long, 8 mm wide, ovate or rhombic-ovate, acute, acuminate or obtuse, cuneate at base, toothed along whole margin above base, the lower with petioles 1/3-1/2 as long as blade, the upper with petioles ca. 2 mm long; leaves on axillary branches narrower, oblong-ovate, rarely sublanceolate or suboblong; verticillasters usually all included in terminal inflorescence, in flower broadly ovoid or suborbicular, rarely lower verticillasters on main stem more or less remote; leaves subtending semiverticels lanceolate or linear-lanceolate; bracts linear, 4.5-6 mm long, much shorter than calyx, both bracts and calyx blue-violet and densely covered with long spreading sericeous-arachnoid jointed hairs (forming a dense fringe at margins) intermixed with short glandular hairs

and punctate yellow glands; calyx 7–8 mm long, 2–3 mm wide; teeth oblong-triangular, 2–2.5 mm long, 1–1.5 mm wide, acuminate, all equal or the lower slightly narrower, (2/5) 1/2 as long as tube; corolla light blue, pubescent outside, 16–18 mm long, the tube exserted from calyx for 1.5–2 mm; upper lip (2.5) 3 mm long, cleft to 2/3 into obtuse lobes; middle lobe of lower lip 4.5–5 mm long, 7–8 mm wide, tapering to a broad claw 0.4–0.6 mm long, the lateral lobes (0.7) 1–1.25 mm long, 2.5–3.5 mm wide, triangular flat; upper stamens not exceeding upper lip; nutlets oblong-ellipsoid, 1.6–2 mm long, 0.7–1.25 mm wide, blackish-brown. Fl. June–July; fr. from middle of July.

From alpine belt to upper timberline, taluses and stony places. — Centr. Asia: Dzu.-Tarb. (Dzungaria Ala-Tau). **Gen. distr.:** Dzu.-Kash. (Boro-Khoro Range, Kuldzha region). Type in Leningrad.

10. *N. mariae* Rgl. in Tr. Bot. sada, VI (1879) 359; Lipsk. in Tr. Bot. sada, XVIII, 97; O. and B. Fedch. Perech. rast. Turk. V, 140.

318 Perennial; root multicapital, knotty, longitudinally splitting into coarsely fibrous sections, in upper part to 8 cm across; stems 12–40 cm high, 1.2–2.5 mm across, covered with a mixture of crisp simple jointed hairs (these usually fairly long on upper part of stem and under nodes) and very small glandular hairs; lateral branches all sterile, very short and slender, only few with developed internodes; leaves mostly densely covered on both sides with very short (longer only on veins) simple crisp hairs intermixed with small glandular hairs; cauline leaves 10–23 mm long, 8–12 mm wide, the lower with petioles 2.5–4 mm long, the upper with petioles 1–2 mm long, broadly ovate, with broadly cuneate or rounded-cuneate, sometimes truncate base, acute or obtuse, the upper sometimes acuminate, the marginal teeth large, acute or obtuse, closely approximate; leaves of lateral branches oblong-elliptic or ovate-lanceolate; inflorescence with 1, rarely 2 remote verticillasters, its terminal part 1.5–4 cm long, at flowering globose (smaller inflorescences) to oblong-ellipsoid; bracts and calyx bluish-violet, very densely beset with small glandular hairs and sparse sessile yellow punctate glands, with long white simple hairs forming a dense fringe along the margin and rather densely covering calyx mainly along the nerves; bracts much shorter than calyx, linear or lanceolate-linear; calyx 7.5–9 mm long, the teeth triangular-lanceolate or oblong-triangular, acuminate, the upper 1/3–1/2 as long as tube; corolla 12–15 mm long, pubescent outside, blue, its tube not exceeding calyx; upper lip 2.5–4 mm long, cleft to middle into obtuse broad lobes; middle lobe of lower lip 3–3.5 mm long, 5–6 mm wide, the lateral lobes 0.8–1 mm long, 2–3 mm wide, sometimes undulate; stamens not exceeding upper lip; nutlets dark brown, obovoid, 2.2–2.4 mm long, 1.25–1.4 mm wide. Fl. July–August; fr. from last half of August.

Alpine and subalpine belts, also upper part of the forest belt, wet grass plots, stony placers, river banks. — Centr. Asia: T. Sh. (Fergana, Chatkal', Pskemsk ranges, eastern part of Talass Ala-Tau), Pam.-Al. (Turkestan and Zeravshan ranges). Endemic. Described from W. Tien Shan. Type in Leningrad.

11. *N. pulchella* Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 282, Fig. 1.

Perennial; root ascending, woody, longitudinally splitting at lower end into fibrous sections, branching in upper part, multicapital, extending into short rhizome, this densely covered with brown scales; stems few (up to 10), 25–35 cm long, erect, robust, 1.5–2.5 mm

across at base, with mixture of very short profuse simple hairs and very small scablike glandular hairs; axillary branches developing nearly at all nodes except for 2-4 of the lowermost, but usually rudimentary, very slender, with 2-4 short internodes, always sterile;

319 lowermost leaves squamiform, brown, long-persistent; other cauline leaves pale green, covered (like stems) with very short hairs visible only under magnifying glass and sparse punctate yellow glands, to 27 mm long and 12 (18) mm wide, oblong-ovate or oblong-elliptic, occasionally ovate, acute or obtuse at apex, cuneate at base, the margin unevenly and acutely toothed from base or only in upper part, the petioles 3-4 mm long; upper leaves subsessile, often entire; leaves on sterile axillary branches oblong or narrowly lanceolate, remotely serrate or the upper sometimes entire; floral leaves sessile, the lower resembling cauline leaves but narrower, lanceolate, the upper bracteiform; verticillasters dense, sessile, the lower 2-4 (5) remote, others forming a dense spicate inflorescence, this (1.5) 2-4 cm long, oblong-ovoid or subcylindrical (ovoid in weak specimens); pedicels 2-3 (5) mm long; bracts lanceolate or linear-lanceolate, sometimes as long as calyx-tube but mostly half as long, partly or rarely completely violet-blue, all densely beset with very small glandular scablike hairs; long white simple hairs covering the nerves and forming a dense fringe around the margin; calyx violet-blue, 6.5-8 (10) mm long; teeth triangular-lanceolate, long-acuminate, the upper approximately 2/5 as long as the tube, the lower slightly shorter and narrower; corolla plain pale blue, puberulent outside, 10-13 mm long, the tube exerted only about 1 mm, curved, abruptly expanding into neck; upper lip ca. 2.5 mm long, cleft to 2/3-3/5, the lobes broad, ovate, rounded above, 1.5-1.75 mm long, 1.75-2 mm wide; middle lobe of lower lip 3-3.5 mm long, 5-6 mm wide, horizontally spreading, with a shallow notch at apex and slightly sinuate margin; lateral lobes rounded, 0.75 mm long, 1.75-2 mm wide; upper stamens and style as long as upper lip; anthers blue; nutlets brown, obovoid, obtusely 3-angled, 2.3-2.5 mm long, 1.3-1.7 mm wide. Fl. second half of June-August; fr. from last half of July.

Subalpine zone and upper timberline, northern slopes in meadow coenoses. — Centr. Asia: T. Sh., western part of Talass Ala-Tau. Endemic. Described from Kshi-Kaında River (basin of Aksu River). Type in Leningrad.

Note. *N. pulchella* recalls *N. mariae* Rgl. and *N. kokamirica* Rgl. *N. mariae* Rgl. differs from *N. pulchella* in having broad, ovate leaves, denser pubescence, dense, large, acute teeth along the margin, the inflorescences usually only with 1, rarely 2 remote semiverticels and shorter corolla-tube. *N. kokamirica* Rgl. is distinguished by well developed,

320 long axillary branches usually bearing inflorescences, only 1-2 remote semiverticels on the main inflorescence, larger (16-18 mm long) corollas and longer and denser hairs covering the stems and leaves.

12. *N. tyttantha* Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 288, Fig. 2.

Perennial, strongly branching; stems 40-60 cm long, ascending, 2.5-3 mm across in lower part, branching from base; branches long, many as long as stem, sometimes longer, all usually terminating in inflorescence; stems and axillary branches densely covered (at least in lower part) with very short white simple spreading hairs and very small glandular ones; leaves pale green, glaucescent, densely covered, especially when young, with hardly visible (magnifying glass!) hairs similar to those on stems but interspersed with punctate

yellow glands, on stems oblong-ovate; uppermost leaves lanceolate, 16–20 mm long, (6) 8–12 mm wide (smaller on axillary branches), rounded or subcordate or some cuneate at base, gradually acuminate above, at margin with large acute, more or less appressed teeth, all leaves distinctly petiolate, the petioles $1/8$ – $1/3$ as long as blade, shorter in upper leaves than in lower; lower bracts resembling cauline leaves, the others bracteiform; inflorescence dense, spicate, narrow, cylindrical or oblong-ovoid, 2.5–4 cm long, commonly without remote verticillasters, rarely one subremote; semiverticels sessile; pedicels 0.5–1.5 mm long; bracts 1.5–3.5 mm long, linear-lanceolate or linear, reaching the middle of calyx-tube or the largest the base of teeth, at margin with a fringe of long white 3–5 (6)-jointed simple hairs; calyx small, (4.5) 5–5.3 mm long, 1.3–1.5 mm wide, tubular-obconical, slightly curved, nearly 2-lipped, with strongly oblique throat, densely covered outside with very small glandular hairs interspersed with punctate glands, and with long jointed simple hairs along nerves and at margin of teeth, the teeth oblong-triangular, acuminate, the 3 upper $1/3$ – $2/5$ as long as tube; corolla blue-azure, sparsely pubescent outside, 8.5–9.5 mm long, the tube 4.5–5 mm long, not exerted, abruptly expanding at front into neck; upper lip 2–2.5 mm long, deeply cleft into 2 broad obtuse lobes; middle lobe of lower lip sessile, ca. 2.5 mm long, 5 mm wide, broadly and rather deeply notched; lateral lobes rounded, 0.5–0.75 mm long, 1.5–1.75 mm wide; style and upper stamens slightly longer than upper lip; nutlets oblong, tapering at both ends, brown, 1.5–1.6 mm long, 0.6 mm wide. Fl. June–July; fr. from August.

- 321 Along banks of mountain streams in subalpine belt. — Centr. Asia: Pam.-Al. (southern slope of Gissar Range). Endemic. Described from Maikhura River, tributary of Varzob River. Type in Leningrad.

Note. Differs sharply from all species of the *Densiflorae* series in having small flowers and in specific shape of leaves. Particular resemblance to *N. kokamirica* Rgl., from which it differs in having, besides small flowers, also inflorescences, usually without remote whorls, different pubescence of stems and leaves, the latter being smaller.

13. *N. odorifera* Lipsky in Tr. Bot. sada, XXIII (1904) 228; O. and B. Fedch. Perech. rast. Turk. V, 143.

Perennial, to 85 cm high and to 2.5–6 mm across, strongly branching nearly from base; branches well developed, almost all terminating in inflorescences; stem and branches grayish due to rather long crisp, more or less interwoven, hairs and also densely covered with very short glandular hairs; leaves on both sides densely (to tomentum) covered with simple hairs interspersed with glandular ones; lower side of leaf covered with closely crowded, punctate yellow glands, on stems 1.5–2.5 mm long, 1.5–2.2 mm wide, cordate or ovate-triangular, with cordate or truncated base, acute or short-acuminate, sharp-toothed, lower leaves on petioles 4–6 (8) mm long, upper on short petioles 2–3 mm long; leaves of branches smaller, of the same shape as on main stem. Semiverticels sessile or on short, 1.5–5 mm long, pedicels; lower two-four verticillasters remote, others forming oblong elliptical spicate inflorescence, on stem 4–6 cm long (on lateral branches smaller or ovoid); bracts and calyces purple-violet, densely covered with short glandular hairs, along nerves and at margin long, white, simple hairs; bracts from narrow-lanceolate to narrow-linear, 2.5–4.5 mm long, sometimes equaling length of calyx-tube, sometimes reaching the middle of it; calyx 7–8 mm long, 2–2.5 (3) mm wide, narrow, cylindrical-obconical, three upper teeth

oblong-triangular or lanceolate-triangular, acuminate, $1/3-1/2$ time as long as tube, two lower teeth usually narrower, sometimes longer to lanceolate-linear; corolla 16-17 mm long, with tube exerted approximately to $1/3$ of its length from calyx, upper lip 3-4 mm long, notched to about the middle to form two obtuse broad lobes; lower lobe of middle lip sessile, 3-3.5 mm long, 5-7.5 mm wide, with or without small apical notch, lateral lobes triangular, 1.5 mm long, 2.5 mm wide; nutlets brown, oblong, 2.5 mm long, 0.75-1 mm wide. Fl. to September; fr. September.

Subalpine and alpine belts. — Centr. Asia: Pam.-Al. (Darvaz and surrounding area). Endemic. Described from Kugi-Frush Mountains. Lectotype in Leningrad.

- 322 Series 3. *Bucharicae* Pojark. — Upper verticillasters forming a short-cylindrical or ovoid terminal inflorescence, the lower 1-3 remote; calyx with oblique throat and lanceolate or triangular teeth; middle lobe of lower lip of corolla with remotely and coarsely crenate margin; bracts usually shorter than calyx; cauline leaves ovate to lanceolate, the largest (3.5) 4-9 mm long. Plants of subalpine and alpine belts.

Besides the Central Asian species, *N. clarkei* Hook. fil. (W. Himalayas) and *N. pubescens* Benth. (E. Afghanistan) should also be included in this series.

14. *N. bucharica* Lipsky in Tr. Bot. sada, XXIII (1904) 217; O. and B. Fedch. Perech. rast. Turk. V, 140.

- Perennial, to 80 cm high; root thick, woody, coarsely fibrous, passing above into multicapital rhizome covered with brown squamiform leaves; stems erect or ascending, at base 8 mm across, more or less densely covered with small sessile capitate glands intermixed with very long spreading simple hairs, mostly branching nearly from base; branches sterile or the upper and sometimes nearly all with small inflorescence at summit; cauline leaves generally 3.3-3.5 cm long, 2.4-3 cm wide, rarely to 4.8-5.5 cm long and 3.5-4 cm wide, ovate or broadly ovate (on axillary branches narrower and smaller), acute or obtuse, with cordate or deeply cordate base, at margin rather large-toothed or crenate, covered with flexuous simple hairs (these longer on veins) and small whitish sessile glands; punctate oil glands copious on lower side, sparse on the upper; petioles $1/4-1/3$ ($1/2$), the upper ca. $1/8$ as long as blade; lower floral leaves resembling upper cauline leaves, the upper narrower, mucronate, subbracteiform; terminal inflorescence subglobose to oblong-ovoid, with 1-3 (4) remote verticillasters below; semiverticels of lower verticillasters distinctly peduncled, the others subsessile; bracts lanceolate to linear, green or violet, crisp-hairy at margin, reaching the middle of calyx or the base of its teeth; calyx 6.5-9 mm long, 2-2.5 mm wide, green or violet, densely covered with crisp hairs; upper teeth triangular or triangular-lanceolate, $1/3-1/2$ as long as tube, the lower narrower, to linear-lanceolate, all terminating in a rather rigid but not spinous point; corolla 14-19 mm long, lilac-blue, pubescent outside, the narrow part of tube half as long again as calyx; upper lip cleft to $1/3-1/2$ into broadly ovate obtuse lobes; middle lobe of lower lip 3-4 mm long, 5-7 mm wide, broadly and rather deeply emarginate, the lateral lobes 2-2.5 mm long, 2-3 mm wide, triangular or ovate-triangular; stamens and style slightly longer than upper lip; nutlets elongate-ellipsoid, 1.75-2.5 mm long, 0.75-1 mm wide, brown, dull. Fl. second half of June to first half of October; fr. from August. (Plate XX, Figure 1.)
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Subalpine belt, in grass plots, banks of streams near waterfalls. — Centr. Asia: T. Sh. (Chatkal, Talass, Fergana, Uzun-Akhmat ranges), Pam.-Al. (Gissar, Peter the First ranges, Darvaz and surrounding area). Endemic. Described from mountain pass Sagyrdasht in Darvaz Range. Type (lectotype) in Leningrad.

Notes. 1) Crosses between this species and *N. formosa* Kudr. (see Note to *N. formosa*) occur frequently.

2) Apparently there is a disruption in the distribution area of *N. bucharica* between the Pamir-Alai section and the W. Tien Shan section. Painstaking comparison of the herbarium specimens from within these two sections has provided no basis for separating from *N. bucharica* the two species observed in the S.N. Kudryashev herbarium: *N. ferganensis* Kudr. (specimen from Uzun-Akhmat Range) and *N. talassica* Kudr. (mountain pass Karagoin ravine in the western part of Talass Ala-Tau). The shape of the calyx and corolla, character of indument, shape and color of the nutlets of these "species" are the same as in the typical *N. bucharica*. Also the shape of the inflorescence and leaves does not depart from variations within *N. bucharica*. All that can be pointed out is the consistent deep violet of the calyx and bracts in specimens from W. Tien Shan while, among the Pamir-Alai plants, specimens often occur with a weakly pigmented calyx which clearly does not provide a basis for establishing the Fergana plant as (one or more) species. For a definitive solution comparisons must be made of the plants in nature in both areas of *N. bucharica*. Characters that are lost in the herbarium, such as corolla color and scent, could then be determined.

Economic importance. The plant yields a pale yellow essential oil with a strong odor. The properties of the oil have not yet been investigated (Kudryashev, 1932).

15. *N. maussarifii* Lipsky in Tr. Bot. sada, XXIII (1904) 216; O. and B. Fedch. Perech. rast. Turk. V, 140.

324 Perennial, 45–75 cm high; root thick, to 2.5 cm across, woody, coarsely fibrous, passing into a thick multicapital rhizome; stems erect, 2–4 mm across, densely leafy, velutinous with very short simple hairs and farinaceous with minute sessile glands, branching nearly from base; branches mostly sterile, few terminating in inflorescence; basal leaves brown, squamiform; cauline leaves grayish on both sides with short flexuous hairs, ovate or triangular-ovate (often narrower on axillary branches), to 3.5–4 cm long, 2.5–3 cm wide, acute or obtuse, with cordate or some with subhastate-cordate base, mostly distinctly or obscurely crenate, partly entire or acutely toothed; petioles gray-tomentose-pubescent, the lower 2/5–1/2 as long as blade, the upper leaves 2/7; all verticillasters crowded in ovoid spicate terminal inflorescence or 1–2 (3) lower remote; lower floral leaves resembling the cauline, the upper much smaller, entire, sessile; bracts violet, narrowly lanceolate, reaching the middle of calyx or the base of its teeth; leaves subtending semiverticels slightly broader and longer, beset outside with small whitish glands, at margin villous-hairy; calyx 14–15 (17) nerved, violet, 7–8 mm long, whitish with spreading crisp hairs, the upper teeth triangular-lanceolate or lanceolate, 1/3–1/2 as long as tube, the lower longer and narrower; corolla bluish, 12–16 mm long, pubescent, the narrow part of tube slightly exserted, abruptly dilated into wide throat; upper lip 2.5–3.3 mm long, cleft to middle into broad obtuse lobes; middle lobe of lower lip 3–4 mm long, 4–5.5 mm wide, broadly emarginate, with slightly sinuate-dentate margin, the lateral lobes 1.3–1.5 mm long, 2–2.5 mm

wide, semiorbicular or triangular-semiorbicular; stamens and style nearly as long as upper lip; nutlets oblong-obovoid, dark brown. Fl. July–September; fr. from end of July.

Central Asian juniper and alpine belt, banks of small rivers and streams. — Centr. Asia: Pam.-Al. (western part of Zeravshan Range and Darai-Nikhan Mountain). Endemic. Described from vicinity of Mausarif village in western part of Zeravshan Range. Type in Leningrad.

16. *N. alatavica* Lipsky in Tr. Bot. sada, XXIII (1904) 214; O. and B. Fedch. Perech. rast. Turk. V, 140. — *N. menthoides* β . *virescens* Rgl. in Tr. Bot. sada, VI, 2 (1880) 360. — *N. kokanica* Franch. in Ann. Sc. Nat. VII sér. XVIII (1884) 230, non Rgl.

325 Perennial, to 1 m high; stems in lower part to 4–5 mm across, branching from base, densely covered with short spreading hairs; branches slender, densely leafy; leaves densely covered on both sides with crisp hairs, narrow, oblong-ovate to lanceolate, with cuneate or rarely subtruncate base, gradually acuminate, at margin with acute (rarely obtuse) teeth, to 4.5 cm long, 18 mm wide; verticillasters dense, 1 or 2 lower remote, others grouped in ovoid or oblong spicate terminal inflorescence; lateral axillary branches also usually terminating in inflorescence; floral leaves lanceolate or linear, often narrowly linear, shorter than calyx; calyx 5–6.5 (7) mm long, like bracts blue-violet, densely covered outside with long crisp implexed hairs, 15-nerved, strongly oblique, the upper teeth lanceolate-triangular, 1/3–2/5 as long as tube, the lower lanceolate, all long-acuminate but not aristate; corolla bluish, pubescent outside, 10–13 mm long, twice the length of calyx, the narrow part of tube slightly exserted; upper lip ca. 2.5 mm long, cleft slightly beyond middle into obovate obtuse lobes; middle lobe of lower lip broad, ca. 2.5 mm long, 5 mm wide, shallowly emarginate, with slightly sinuate or coarsely crenate-undulate margin, the lateral lobes broad, orbicular-triangular, 1 mm long, 2 mm wide; lower stamens equaling upper lip, the upper 1.2 mm longer; style as long as upper stamens; ripe nutlets dark brown, ellipsoid, 1.3–1.5 mm long, 0.6–0.7 mm wide. Fl. June–August; fr. from August.

Subalpine and alpine mountain belts. — Centr. Asia: T. Sh. (Talass, Pskem and Ugam ranges). Endemic. Described from Talass Range. Type (lectotype) in Leningrad.

17. *N. schugnanica* Lipsky in Tr. Bot. sada, XXIII (1904) 220; O. and B. Fedch. Perech. rast. Turk. V, 140.

Perennial, to 75 cm high or slightly higher; stems to 6 mm across, ascending, brown in lower decumbent part, with few pairs of brown squamiform leaves, branching nearly from base, more or less villous with long crisp white hairs intermixed with small sessile scablike glandular hairs; leaves to 6 cm long, 5 cm wide, orbicular or broadly ovate, with deeply cordate base, short-acuminate or obtuse apex, coarsely crenate, grayish-velutinous on both sides, the hairs implexed, crisp, simple, dense at first, later partly disappearing, especially in lower leaves; leaves of axillary branches sometimes narrower than the cauline to oblong-ovate; petioles villous-hairy, 1/3 as long as blade in lower leaves and 1/7 in upper; upper verticillasters crowded at apex of stem and of axillary branches in ovoid-spicate inflorescence, the lower 1 or 2 remote; lower floral leaves resembling the upper cauline, sometimes exceeding flowers, the upper narrower, always shorter than flowers; bracts linear-lanceolate or linear, green, reaching calyx-teeth, rarely shorter than calyx, sometimes nearly as long; calyx 13-toothed, green, densely covered, like bracts, with whitish scablike

glands and punctate aromatic glands, with long crisp hairs along nerves and margin, 7–8 mm long, 2–2.5 mm wide, the throat strongly oblique; upper teeth triangular or lanceolate-triangular, approximately 1/3–2/5 as long as tube, the lower narrowly lanceolate, long-acuminate, all teeth without rigid mucro; corolla 13–15 mm long, bluish, covered outside with crisp hairs, the narrow part of tube exerted to 1/4, abruptly expanding into broad neck; upper lip approximately half as long as the lower, cleft slightly beyond middle into 2 broadly obovate or sometimes nearly semiorbicular obtuse lobes; middle lobe of lower lip oblate, 2–3 mm long, 4–4.5 mm wide, emarginate, the lateral lobes much smaller, 1.3–1.5 mm long, 2–2.5 mm wide, broadly triangular or nearly semiorbicular; upper stamens and style slightly exceeding upper lip. Fl. August.

Stony mountain slopes in subalpine belt. — Centr. Asia: Pam.-Al. (Shugnan). Endemic. Known only from location: Bakhan, between Nishus and Anderob villages on Pyandzh River. Type in Leningrad.

Series 4. *Supinae* Pojark. — Verticillasters forming a globose or subglobose-ovoid capitate terminal inflorescence, lowermost whorl (very rarely 2) remote; throat of calyx strongly oblique or 2-lipped, the teeth much shorter than tube, lanceolate or triangular; middle lobe of lower lip of corolla with slightly sinuate or entire margin, bracts slightly shorter than calyx; cauline leaves broad, small, largest 1.5–2.5 mm long. Low plants of high mountains.

In addition to the three Central Asian and two Caucasian species, *N. eremocosmos* Rech. fil. (central Elburz in N. Iran) and *N. pseudosupina* Pojark. (Kashmir) should be included in this series.

18. *N. supina* Stev. in Mém. Soc. Nat. Mosc. III (1812) 265; M. B. Fl. taur.-cauc. III, 391; Ldb. Fl. Ross. III, 373; Benth. Lab. gen. et sp. 473; Boiss. Fl. or. IV, 642; Grossg. Opred. rast. Kavk. 331. — *N. fissa* Benth. l. c. 471 (non 737) quoad. descr. (excl. loco), non C. A. M. — *Dracocephalum caucasicum* Lipsky et Akinf. in Tr. Bot. sada, XIII (1894) 326. — *Nepeta caucasica* Somm. et Lev. in Nouv. Giorn. Bot. Ital. IV, 2 (1897) 298. — Ic.: Tr. Bot. sada, XVI, Plate XLI. — Exs.: GRF, No. 223; Fl. Cauc. exc. No. 293.

Perennial; root fibrous, more or less twisted, passing above into branching rhizome, this like root covered with blackish-brown bark and squamiform leaves; stems numerous, 10–30 cm long, ascending or nearly decumbent, more or less densely covered with short jointed simple hairs and small whitish capitate glands, not branching or with few axillary branches, the lower branches often decumbent, long but only rarely developing inflorescence; other branches short, with undeveloped internodes; leaves yellow-green, when young often rather densely covered with shaggy simple hairs and very small glandular ones, also with punctate glands beneath, later often subglabrous except on veins; cauline leaves 1–2 (2.5) cm long, 0.7–1.8 (2) cm wide, ovate, with truncate or rounded or sometimes cuneate or shallowly cordate base, acute or obtuse; leaves on branches smaller and often narrower, the margins evenly large-toothed or almost crenate, the petioles 2–3 mm long; upper leaves sessile; semiverticels subsessile, forming a rather dense subglobose-ovoid capitate inflorescence, sometimes 1 verticillaster remote; floral leaves resembling upper cauline leaves, slightly shorter than calyx, lanceolate-linear or linear, covered like calyx

with very small glandular hairs, the margin with a dense fringe of long simple jointed hairs; calyx 7-8.5 mm long, slightly curved, blue in lower part, rarely all blue, 2-lipped or nearly so, the 3 upper teeth triangular, acute or more or less acuminate, $(1/6) 1/4-1/3$ as long as tube, the 2 lower lanceolate or narrowly lanceolate, long-acuminate or sometimes nearly subulate-acuminate, half as long again to twice as long as upper teeth; corolla bright blue, 14-20 mm long, the tube exerted nearly half its length, expanding above into large neck, 4.5-5.5 mm long, 5-6 mm wide; upper lip 2.5-3.3 mm long, cleft nearly to base into obtuse broadly ovate lobes; lower lip with subtetragonal middle lobe, 3-4 mm long, 6-7 mm wide, the semiorbicular lateral lobes 1-1.3 mm long, 2-2.5 (3) mm wide; upper stamens as long as upper lip; lower stamens distinctly shorter than the upper; nutlets dark brown, elongate-ellipsoid, 2 mm long, 0.75-1 mm wide. Fl. second half of July to September; fr. from August.

Stony and gravelly places in alpine belt, moraines, pebbles, rock crevices. — Caucasus: Main Range, Dag., E. Transc. (Kuba area). Endemic. Described from Main Range, Khodzhal River near foot of Tfan-Dag peak. Type in Helsinki, topotype in Leningrad.

Note. The taxonomic position of this species has not been satisfactorily elucidated to date. In their systems, Boissier and Briquet placed it in section *Cataria* although, except for the smooth nutlets, *N. supina* has nothing in common with the other species in this section either in the structure of flowers and inflorescence or in habit.

19. *N. buschii* Sosn. et Mand. in Zam. po sist. i geogr. rast. Bot. inst. AN Gruz. 16 (1951) 10. — *N. supina* auct.: Grossg. Fl. Kavk. III (1932) 293; idem., Opred. rast. Kavk. 331, p. p. non Stev. — *N. citriodora* Sosn. et Mand. in Bot. zhurn. SSSR, XXXIX (1949) 287, non Dum. nec Baker.

328 Perennial, 15-50 cm high; root as in *N. supina*; stems numerous, erect from ascending base, in lower part to 3.5 mm across, more or less densely covered with long simple white jointed hairs and very small whitish glands, with internodes to 2.7 cm long (in lower part to 10 cm), usually branching; branches partly short, sterile, partly terminating in inflorescence and reaching 25 cm in length; leaves pale green, 1.5-2.5 cm long, 1-2.2 cm wide, ovate, cuneate at base, mostly acutish, along margin with large obtuse teeth, rather densely covered between the veins above and mostly on the veins beneath, with appressed shaggy hairs and often rather copious minute sessile whitish glandular hairs as well as sparse yellow resinous punctate glands; petioles 1-2.5 mm long; verticillasters at ends of stems and of lateral branches forming an ovoid capitate inflorescence 2-2.5 cm long, sometimes 1 verticillaster remote; floral leaves resembling the cauline leaves but distinctly smaller, lanceolate, long-acuminate, slightly shorter than calyx; calyx 9-11 mm long, 2-lipped, usually sparsely (rarely densely) covered, like bracts, with minute glandular hairs, on nerves and margin with simple shaggy jointed hairs, these forming a long fringe at the margin of teeth; lower teeth lanceolate to lanceolate-subulate, 3.5-4.3 mm long, $2/5-1/2$ as long as tube; upper teeth narrowly triangular, acuminate, 2.5-2.8 mm long; corolla 20-27 mm long, bright blue, the tube 10-16 mm long, curved, abruptly expanding above into large neck, 5-6 mm long, 5.5-6.5 mm wide; upper lip 3.5-4 mm long, cleft to $2/3$ into obtuse lobes, 2.5-2.8 mm wide; lateral lobes of lower lip broadly triangular, 2-2.5 mm long, 2.7-3 mm wide, the middle lobe 4-5 mm long, 7-8 mm wide; nutlets oblong-obovoid, brown, 2.5 mm long, 1 mm wide. Fl. July-August; fr. August.

Alpine belt, stony and gravelly placers. — Caucasus: S. Transc. (Aragats and Kapudzhikh mountains). **Gen. distr.:** Arm.-Kurd. (Mount Ararat). Described from Aragats Mountain in Armenia. Type in Tbilisi.

Note. A species very closely allied to *N. supina* Stev. from which it differs mainly in having much larger flowers and more erect, higher and thicker stems.

Economic importance. The plant has a very strong lemon scent and may possibly be of value in the perfume industry. An ornamental.

20. *N. kokanica* Rgl. in Izv. Obshch. lyub. est. antr. i etn. XXXIV, 2 (1882) 65; O.
329 and B. Fedch. Perech. rast. Turk. V, 141, p. p. — *N. cephalotes* var. *brevipedunculata* Rgl., op. cit. 65. — *N. pamiroalaica* Lipsky in Tr. Bot. sada, XXIII (1904) 230, p. p.

Perennial, grayish or whitish with dense indument; root to 4 cm across, dark brown, twisted, strongly splitting, passing into rhizome, the numerous, dark brown, more or less woody stem bases hidden under rubble, covered, like the rhizome, with squamiform leaves; stems (5) 10–40 cm high (generally 20–30 cm), slender, ascending or erect, branching all the way up, more or less densely tomentose, often (var. *hissarica* (Lipsky) Fedtsch.) with loose white tomentum of long implexed hairs at nodes and particularly under inflorescence; branches mostly short, rudimentary, seldom developed, terminating in inflorescence; leaves rather thick, covered on both sides with dense tomentum; cauline leaves 5–15 cm long and wide, orbicular or rhombic-ovate, at times subreniform, obtuse or short-acuminate, with entire cuneate base and toothed or crenate margins, all petiolate, the petioles $2/7$ – $2/3$ as long as blade; leaves of axillary branches smaller and often narrower; terminal head (2) 2.5–3.5 cm across, 1.7–3.5 cm long, sometimes a solitary remote verticillaster present below; floral leaves resembling the cauline but smaller and often narrower, shorter than calyx, narrowly linear, covered outside, like calyx, with small capitate glands, at margin with a dense fringe of hairs, these long, very fine, implexed, simple, jointed (consisting of 5–18, sometimes to 28 cells), usually unbranched, occasional hairs with 1–2 rudimentary branches of 1 (2) cells; calyx 6–7.5 mm long, with strongly oblique throat, more or less violet, the teeth narrowly triangular or tubular-lanceolate, usually tapering from the middle to a narrow nearly subulate point, all nearly equal, the upper $2/3$ as long as tube; corolla (pale?) blue, 15–18 mm long, slightly pubescent and glandular outside, the tube exerted 2–2.5 mm; upper lip 2.7–3.25 mm long, cleft to $1/3$ into obtuse obovate lobes; middle lobe of lower lip 3.8–4.5 mm long, 6–6.5 mm wide, with broadly emarginate lateral lobes 1 mm long, 3 mm wide, nearly semiorbicular; nutlets dark brown, slightly attenuate toward base, trigonous, 2–2.3 mm long, 1–1.8 mm wide. Fl. second half of July to September; fr. second half of August (Plate XX, Figure 2.)

Gravelly and stony placers, rock crevices in alpine belt. — Centr. Asia: Pam.-Al. (Alai, Turkestan, Peter the First, Zeravshan, Gissar and Darvaz ranges). **Gen. distr.:** Dzhuz.-Kash. Described from the northern slope of Turkestan Range, Dzhityk pass (upper part of basin of Isfara River). Type in Leningrad.

- 330 **Notes.** 1) Lipskii renamed this species *N. pamiroalaica* Lipsky because Regel', in describing *N. kokanica*, had erroneously referred some specimens to another species (under the name "*N. cephalotes* Boiss. var. *brevipedunculata* Rgl.>"). The diagnosis of *N. kokanica* itself is not quite accurate, but these mistakes could hardly provide justification for renaming *N. kokanica* Rgl. which was described in keeping with the rules of



PLATE XX. 1 – *Nepeta bucharica* Lipsky, summit of plant, flower, nutlet; 2 – *N. kokanica* Rgl., general aspect, flower, nutlet; 3 – *N. ladanolens* Lipsky, summit of plant, flower, nutlet.

international botanical nomenclature, and in accordance with these rules the name *N. kokanica* Rgl. should be retained. In the process, Lipskii, on the assumption that he was merely renaming *N. kokanica* Rgl., extended the range of this species and included in it *N. pamirensis* Franch., a species that morphologically and geographically differs from *N. kokanica* Rgl. (see Note on *N. pamirensis*) and whose independent status is here-with restored.

2) For some reason, Lipskii left the taxonomic position of *N. kokanica* unresolved, even though he legitimately included closely related species of the series *Bucharicae* in the section *Spicatae*. In "Perechen' rastenii Turkestana," O. and B. Fedchenko placed this species in the section *Capituliferae* without any justification whatsoever.

21. *N. pseudokokanica* Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 291.

Perennial, easily distinguished from *N. kokanica* Rgl. in outer appearance by the greenish or even green leaves, covered on both sides with short crisp 2-5-jointed hairs, these distinctly spreading on veins; stems, branches and petioles more or less densely covered with similar spreading hairs; stems ascending or often arcuately curved, branching from base; branches developed, with several pairs of leaves, branching and usually terminating in inflorescence; cauline leaves ovate, broadly ovate, with rounded-cuneate or cuneate base, mostly acute, the margin with 4-5 rounded, often outward-curved teeth; inflorescence terminal, capitate; remote verticillasters 1 or occasionally 2; floral leaves resembling the cauline or bracteiform; bracts shorter than calyx, lanceolate or lanceolate-linear, long-acuminate, densely covered outside, like calyx, with very small capitate glands and simple, the nerves and margin rather densely covered with eglandular hairs, these 3-5 (8)-jointed, distinctly thicker toward base; calyx 7.5-9 mm long, violet, with strongly oblique throat; teeth lanceolate, produced into nearly subulate mucro, the 3 upper 2/3 as long as tube; corolla 17-18 (19) mm long, the tube distinctly exerted to 2-3 mm; 333 upper lip cleft to 2/3 into obtuse lobes; middle lobe of lower lip oblate, the lateral lobes 1 mm long, 3 mm wide, rounded; upper stamens as long as upper lip or barely exerted; nutlets brown, lustrous, 1.75-2.25 mm long, 1-1.25 mm wide, obovoid, markedly attenuate toward base, slightly truncate at the broad upper end. Fl. from July; fr. from first half of August.

Rocky and stony places in alpine mountain belt. — Centr. Asia: Pam.-Al. (Fergana Range). Endemic. Described from natural boundary Ak-Boguz in the southwestern part of the range. Type in Leningrad.

Note. This species is easily distinguished from both Central Asian species of the series *Supinae* by its habitually scantier indument and greenish or green (not gray or whitish) leaves of thin consistency; it also differs from *N. pamirensis* in the nonbranching hairs and in the corolla-tube being relatively longer in relation to the calyx.

22. *N. pamirensis* Franch. in Bull. Mus. Hist. Nat. II (1896) 345. — *N. pamiro-alaica* Lipsky in Tr. Bot. sada, XXIII (1904) 230, p. p. — *N. kokanica* O. et B. Fedtsch. Perech. rast. Turk. V (1913) 141, p. p. non Rgl. — ? *N. oxicola* Franch. l. c. 346. — *N. supina* Duthie in Alcock, Repert. nat. hist. results Pamir bound. Comm. (1898) 25, non Stev.

Perennial; root and rhizome as in *N. kokanica* Rgl., which this species resembles in outward appearance; stems numerous, tightly crowded, woody in lower part, erect or

more rarely ascending, usually 15–20 cm high (rarely higher), densely covered with branching jointed hairs; branches produced from all internodes but frequently sterile and partly rudimentary, only rarely in the largest specimens upper branches with small terminal inflorescence; leaves gray, with dense short tomentum on both sides, on stems 4–14 mm long, 5–11 mm wide, flabelliform or rhombic-obovate, with entire cuneate base and evenly crenate margin; petioles tomentose, $1/4$ – $1/3$ (rarely $1/2$ – $2/3$) as long as blade; upper leaves subsessile; floral leaves resembling the cauline but smaller; inflorescence globular or suborbicular-obovoid, 1.5–3.5 cm long, rarely with 1 remote verticillaster below; bracts narrowly linear, shorter than calyx, resembling the cauline but smaller, densely covered outside with small glandular hairs intermixed with punctate yellow glands; long, very fine, arachnoid, implexed, white, jointed, branching, partly 2-branched hairs forming a thick fringe at the margin and also covering the nerves and the margin of teeth; calyx suffused with blue-violet, 6.5–9 mm long, densely covered with small glandular hairs and punctate glands; throat strongly oblique; teeth lanceolate, long-acuminate, the 3 upper $1/2$ – $3/4$ as long as tube; corolla bluish-violet (?), 12.5–16.5 mm long, the tube not exerted from calyx or scarcely exerted to 1 (1.5) mm; upper lip cleft to $2/3$ – $3/4$, the obtuse obovate lobes 1.75–2.75 mm long, 2 mm wide; middle lobe of lower lip broad, 3.5–4.5 mm long, 5.5–8.5 mm wide, emarginate and sometimes with coarsely sinuate margin, the lateral lobes 1–1.25 mm long, 2.3–3 mm wide, nearly semiorbicular; nutlets 2–2.5 mm long, 0.75–1 mm wide, elongate-obovoid to oblong-ellipsoid, brown. Fl. July–October; fr. from August.

In alpine belt, mixed grass-sheep's fescue and wormwood-meadowgrass steppes, cobresia-sedge meadows, exposed stony and gravelly slopes, moraines, dry pebble-beds. — Centr. Asia: Pam.-Al. (W. and E. Pamir). **Gen. distr.:** Afghanistan, areas adjacent to Pamir and Ind.-Him. (Hindu Kush and NW Himalayas). Described from Bazai-Gumbez (upper part of basin of Vakhn-Darya River) in northeastern part of Afghanistan. Type in Paris.

Note. In habit *N. pamirensis* Fr. does not differ from *N. kokanica* Rgl. but is clearly differentiated from this species by two characters: 1) strongly branching hairs, with branches consisting of several cells (joints) and branching in turn; and 2) the narrow part of corolla-tube scarcely exerted from the calyx. The distribution area of *N. pamirensis* differs from that of *N. kokanica*. *N. pamirensis* has been unjustly neglected and has never appeared in the Russian literature. This is perhaps explained by the fact that Lipskii, in his time, having found no differences between *N. pamirensis* Fr. and *N. kokanica* Rgl., included it in the latter which he inaccurately named *N. pamiroalaica* Lipsky (see Note to *N. kokanica*).

Section 3. **Capituliferae** (Benth.) Pojark. comb. nov. — Sect. *Pycnonepeta* § *Capituliferae* Benth. in DC. Prodr. XII (1848) 379. — Sect. *Eunepeta* § *Capituliferae* Boiss. Fl. or. IV (1879) 637; Briq. in Pflanzenfam. IV, 3a, 236. — Calyx tubular, slightly curved, with more or less oblique or nearly 2-lipped throat and narrowly triangular teeth; corolla-tube curved and abruptly expanding into short neck; middle lobe of lower lip with swelling at base, concave; nutlets narrowly ellipsoid, smooth, dull; inflorescence consists of a headlike terminal verticillaster (or of several confluent in a head) and of many remote pairs of dense headlike semiverticels, these with elongate peduncles and forming a very lax racemiform or paniculate inflorescence or else sessile or partly subsessile and then

forming an interrupted spike. Perennial plants or sometimes subshrubs, mostly patent-branching at base.

Many species in this section are distributed in W. Himalayas and in Hindu Kush; a number of species grow in the south of Central Asia, and a few are known from Iran.

Subsection 1. *Podocephalae* Pojark. subsect. nov. in Addenda XIX, 354. — All semiverticels (except sometimes the uppermost) with elongate peduncles; aggregate inflorescence loosely racemiform or paniculate; throat of calyx strongly oblique, nearly 2-lipped.

Series 1. *Floccosae* Pojark. — Leafy branches produced only on lower part of stem; leafless peduncles terminating in head-shaped semiverticel developing in the axils of upper leaves. Aggregate inflorescence a raceme.

In addition to the two Central Asian species, this series also contains *N. floccosa* Benth. (Kashmir and E. Afghanistan), *N. monticola* Kudr. (SE Afghanistan) and *N. cephalotes* Boiss. (Iran).

23. *N. vakhanica* Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 296. — *N. floccosa* O. et B. Fedtsch. Perech. rast. Turk. V (1913) 140; Kudryash. in Bot. mat. gerb. Bot. inst. Uz. fil. AN SSSR, I, 1, 10, p. p. non Benth. — Ic.: Poyark., op. cit. Figure 3.

Perennial; stems 25–30 cm long, ascending, 1.5–3.5 cm across, often reddish, leafy only in upper part, branching at base; branches as long and as thick as stems and densely covered, like stems, with very small capitate sessile or short-stipitate glands forming a yellowish bloom, when young also covered near base with long fine arachnoid simple jointed hairs; 2–3 lower internodes 0.7–2.5 cm long, others except the upper 6–9.5 cm long; leaves in 2–3 approximate nodes, often rosulate, with petioles $1\frac{1}{2}$ – $2\frac{1}{2}$ times as long as blade; leaves of a pair situated at the level of lower fourth or third of the stem short-petioled or subsessile, blade cordate, 1.5–3.5 cm long and wide, obtuse, crenate at margin, thin, soft, greenish or grayish, more or less densely covered on each margin with thin and loose white tomentum, subglabrous along the veins and thus appearing rugose; semiverticels hemispherically head-shaped, disposed at ends of stem (and radical branches) and of very distant axillary peduncles, forming a very lax racemiform or in lower part rarely paniculate, inflorescence comprising $\frac{2}{3}$ – $\frac{3}{4}$ of the plant; axillary heads (8) 10–65-flowered, to 13 mm long, 336 20 mm wide, much larger than the 2–8-flowered terminal head; peduncles 3–5 cm long (the uppermost shorter), mostly arcuately curved, divergent, often at nearly a right angle; floral leaves and leaves subtending the heads narrowly linear, 4.5–9 mm long, 0.5–1 mm wide; bracts smaller, to subfiliform, violet, with a broad fringe of white or violet arachnoid implexed hairs, approximately $\frac{3}{4}$ as long as calyx; calyx (7) 8–9 mm long, slightly curved above, with nearly 2-lipped throat, violet, densely covered outside with small capitate glands intermixed (often copiously) with punctate yellow glands, the nerves with fugacious lanate-arachnoid hairs; teeth narrowly triangular, long-acuminate, ciliate, the upper $\frac{2}{7}$ – $\frac{1}{4}$ as long as tube, the 2 lower broader at base than the upper; corolla 10–12 cm long, blue, hairy outside and covered with capitate sessile glands, the tube narrow, not exerted or exceeding calyx by 1–1.5 mm, abruptly expanding into short neck; upper lip 1.5–2 mm

long, deeply cleft into obtuse lobes; middle lobe of lower lip 2 mm long, 3.5–4 mm wide, coarsely crenate-incised, the lateral lobes triangular-semiorbicular, 1.3–1.5 mm long; nutlets narrowly ellipsoid, pale brown, 2.5 mm long, 0.75 mm wide. Fl. July–August; fr. from first half of August.

Sliding gravelly taluses and between stones in alpine belt. — Centr. Asia: Pam.-Al. (southern part of W. Pamir: Vakhan). Endemic. Described from Pyandzh River between mountain passes Kizil-Kirchin and Mats. Type in Leningrad.

24. *N. pseudofloccosa* Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 293. — *N. floccosa* Lipsky in Tr. Bot. sada, XVIII (1900) 100; O. and B. Fedch. Perech. rast. Turk. V, 140, p. p. non Benth.

Perennial; stems 15–35 cm long, slightly curved in lower part, densely covered with very small sessile and short-stipitate capitate glands and, when young, with very short dense white tomentum, the lower and upper internodes short, the middle ones 6–9 mm; leaves at 3–4 lower nodes rosulate long-petioled, cordate, or rarely broad-ovate, crenulate; leaves of a remote pair higher up similar but smaller and short-petioled; blade 1.5–2 cm long, 1.3 mm wide, firm, thick, densely covered on both sides with short whitish tomentum, the network of veins impressed above, prominent beneath, not tomentose; semiverticels capitate, hemispherical, borne at the end of stem and of distant axillary peduncles, 337 forming a very sparse racemiform inflorescence; peduncles straight, at an acute angle, the lower to 8 cm long, the upper 1.5–2 cm long; terminal verticillaster 20–70-flowered, globular, much larger than axillary heads; floral leaves subtending semiverticels linear, to 8 mm long, 1 mm wide, covered with small short-stipitate glands; bracts similarly glandular and with a broad fringe of white hairs, shorter than calyx; calyx 6–7.5 cm long, curved, nearly 2-lipped, densely covered outside with short-stipitate and sessile glands and with fugacious tomentose-lanate indument, upper teeth narrowly triangular, 1/4 as long as tube; lower teeth broader, sometimes longer; corolla 9–11 mm long, densely glandular outside; tube exerted to 1.5 mm, narrow, abruptly expanding into wide neck; upper lip cleft into oblong-elliptic lobes; middle lobe of lower lip ca. 2 mm long, 3.5 mm wide, coarsely undulate-crenate, the lateral lobes broadly triangular, ca. 2 mm long, 0.75 mm wide; upper stamens slightly longer than upper lip; nutlets oblong-ellipsoid, pale brown, 1.75 mm long, 0.7 mm wide. August.

Taluses in subalpine belt. — Centr. Asia: Pam.-Al. (Darvaz). Endemic. Described from near Taval-Dara village on Khingou River. Type in Leningrad.

Note. In most characters, *N. pseudofloccosa* approaches the Himalayan *N. floccosa* Benth. rather than *N. vakhanica*. It is hardly distinguishable from *N. floccosa*, in general aspect, but it has a different indument, only one pair of developed cauline leaves, a sparser inflorescence, longer stamens, and less compact heads with fewer flowers.

Series 2. *Badachschanicae* Pojark. — Stems leafy nearly all the way up, strongly branching; axillary branches many, long, leafy, fertile and developing flowering branches; aggregate inflorescence a strongly branching panicle.

A monotypic series.

25. *N. badachschanica* Kudr. in Bot. mat. gerb. Inst. bot i zool. AN UzSSR, IX (1947) 18.

338 Perennial; stems 30–50 cm long, robust, stout, 3–4 mm across, branching at base, gray-tomentulose; lower internodes 0.8–3 mm long, at middle of stem 5–6 cm, toward summit again shorter; axillary branches produced all along the stem, shorter toward summit, mostly (except uppermost) branching and producing several pairs of short fertile branches; leaves on lower part of stem with petiole about the length of blade, firm, thick, 1.5–4.5 cm long, 1.5–3.5 cm wide, the upper side greenish or grayish above, pubescent or tomentose, with impressed glabrous veins, the lower side gray, pubescent-tomentose, with indistinct main veins; petioles white-tomentose; lower floral leaves 7–8 mm long, 3–5 mm wide, elliptic, the upper linear, 4–8 mm long, ca. 1 mm wide; semiverticels capitate, hemispherical, at the end of stem and axillary branches and of peduncles 0.4 mm (the upper) to 1.5 (2) mm long, 8–25-flowered, 1–3 cm long, 1–2 cm wide, forming a compound panicle; leaves subtending semiverticels (heads) and bracts narrowly linear, acuminate, violet, covered above and along the margin, like calyx, with long fine implexed arachnoid white hairs; bracts shorter than calyx; calyx 8–12 cm long, nearly 2-lipped, 15-nerved, curved in upper part; teeth lanceolate, acuminate, the upper $1/4$ – $2/7$ as long as tube; corolla 12–13 mm long, pubescent outside, with more copious and longer hairs on lobes of limb, the tube narrow, slightly exserted, abruptly expanding into short neck; lobes of upper lip oblong-elliptic, obtuse; middle lobe of lower lip oblate, the lateral lobes semiorbicular-triangular; upper stamens as long as upper lip of corolla or slightly longer; style more exserted; nutlets brown, smooth, oblong. End of flowering and fruit in September.

Between stones on cliffs in the wood and scrub belt. — Centr. Asia: Pam.-Al. (Vanch Range in SE Tadzhikistan). Endemic. Described from area between Motraun and Kheikhak. Type in Leningrad.

Subsection 2. *Apodocephalae* Pojark. in Addenda XIX, 355. — Semiverticels, with possible exception of the lowermost sessile or semisessile; aggregate inflorescence seemingly an interrupted spike; throat of calyx oblique.

Series 3. *Ladanolentes* Pojark. in Addenda XIX, 519. — Semiverticels few-flowered, their subtending leaves lanceolate or ovate-lanceolate; bracts lanceolate; calyx with strongly oblique throat; corolla-tube not exserted; leaves green on both sides; all parts copiously glandular-hairy.

One species.

26. *N. ladanolens* Lipsky in Tr. Bot. sada, XXIII (1904) 235; O. and B. Fedch. Perech. rast. Turk. V, 144.

339 Perennial; stems 60–90 cm long, from decumbent base arcuately ascending, branching nearly from base, with internodes 8–12 cm long, densely covered with long fine implexed simple hairs and short yellow-headed glandular hairs; lower axillary branches stout, nearly as long as main stem, leafy, terminating in inflorescence, the upper short, slender, often sterile; leaves grayish-green, covered on both sides with loose appressed gray tomentum (this absent on and near the veins and hence leaves apparently rugose) and yellow-glandular, the lower with petioles about the length of blade, cordate, 1.5–2.8 cm long, 1.3–2.5 cm wide, crenate, the middle short-petioled or subsessile, smaller; all leaves ovate, with

orbicular or cuneate base; lower floral leaves resembling the cauline leaves but smaller, the next above narrower to lanceolate, entire, sessile; semiverticels capitate, small, few-flowered, borne at the end of stem and axillary branches in 3-7 remote pairs, most sessile, only the lower on peduncles 0.7-2 cm long; terminal verticillaster much smaller than the others, 4-6-flowered; leaves subtending semiverticels 5-8 mm long, 0.5-1.4 mm wide, ovate-lanceolate or lanceolate, shorter than semiverticels; bracts lanceolate, usually not exceeding the base of upper calyx-teeth, covered (more densely at margin) with long woolly implex fine jointed eglandular hairs interspersed with short-stipitate glands; calyx 6-8 mm long, densely covered outside with fine short-stipitate glands and spreading hairs; teeth long-ciliate, the upper narrowly lanceolate, $1/3-2/5$ as long as tube, the lower narrower; corolla 8-10 mm long, pubescent and glandular outside, tube not exerted, expanding into minute neck; upper lip 1.2-1.5 mm long, cleft into ovate lobes; lower lip nearly 3 times as long as upper, its middle lobe not clawed, 2.5 mm long, 4 mm wide, coarsely undulate-crenate, the lateral lobes semiorbicular, 0.5 mm long, 1-1.2 mm wide; nutlets 2.2-2.4 mm long, 0.8-0.9 mm wide, oblong-ellipsoid, brown, with distinct rib on ventral side. End of flowering and fruit second half of August. (Plate XX, Figure 3.)

Cliffs in upper part of wood and scrub belt. — Centr. Asia: Pam.-Al. (SE Tadzhikistan). Endemic. Described from western slope of Yazgulemskii Range, from ravine of Obi-Matraun River. Type in Leningrad.

Note. The plant has a very strong, pleasant smell of resin.

Series 4. *Olgaenae* Pojark. — Semiverticels mostly many-flowered (to 20-40), their subtending leaves and bracts lanceolate-linear to filiform or subulate; calyx with slightly oblique throat; corolla-tube distinctly exerted from calyx; leaves white-tomentose beneath (rarely on both sides); glandular hairs absent.

One species.

27. *N. olgae* Rgl. in Izv. Obshch. lyub. est. antr. i etn. XXXIV, 2 (1882) 65; Lipsk. in Tr. Bot. sada, XVIII (1900) 99; O. and B. Fedch. Perech. rast. Turk. V, 114. — Exs.: HFAM, No. 205.

340 Perennial, sometimes almost suffrutescent, all parts covered with snow-white tomentum; root thick, woody, firm; stems many, with woody, perennial branching base to 6 cm across, ascending or erect, leafy, often reddish, especially in lower part, white villous-tomentose, rarely covered with short and dense tomentum, simple or branching, often from base; axillary branches elongate, bearing inflorescence of 2-6 semiverticels, usually much shorter than stem; leaves broadly ovate, obtuse, with cordate or rounded base, mostly green above, more or less densely covered with appressed hairs, rugose by impressed network of veins, white-tomentose beneath (sometimes on both sides), the lower 1.3-3.5 cm long and wide, with petiole about the length of blade, others with shorter petioles, the upper sessile; petioles loosely white villous-tomentose; floral leaves small, 0.5-1 cm long, the lower ovate, the others linear, bracteiform; inflorescence consisting of a terminal capitate verticillaster (or 2-3 spiciformly crowded) and 4-10 distant 8-40-flowered verticillasters; semiverticels sessile or subsessile, only 1-2 lower pairs with peduncles 1 cm long; leaves subtending semiverticels and bracts lanceolate-linear to narrowly linear, subfiliform, $2/5-2/3$ as long as calyx and, like the calyx, white-tomentose with loose and long, rarely short and densely appressed hairs; calyx 6-8 mm long, tubular, slightly curved, attenuate

above, with slightly oblique throat; teeth subequal, narrowly triangular, acuminate or nearly linear, the 3 upper 2-2½ times as long as tube; corolla 11-12 mm long, densely covered outside with nearly tomentose pubescence; tube narrow, curved, exserted to 1.5-2 mm, abruptly expanding to 1 mm long neck; upper lip ca. 2 mm long, half as long as the lower, cleft to the middle into ovate lobes; middle lobe of lower lip with entire or undulant margin, 2.3-2.5 mm long, 3-3.3 mm wide; upper stamens not longer than upper lip; style distinctly exserted; nutlets oblong-ellipsoid, 2-2.5 mm long, 1.75 mm wide, brownish-black, with sharp rib on ventral side. Fl. second half of May-August; fr. from July.

Foothills and dry mountains, semidesert belt, stony and gravelly slopes, mainly limestone and shale, rarely granite or outcrops of variegated sandstone. — Centr. Asia: T. Sh. (Pskem River valley, near Namangan), Pam.-Al. (Mogol-Tau mountains, Turkestan and Zeravshan ranges, northern slope of Alai Range, Baba-Tag Range and apparently, after a gap, in Darvaz and W. Pamir: Khorog). Endemic. Described from vicinity of Ura-Tyub, foothills of Turkestan Range. Type in Leningrad.

- 341 Note. The var. *mogoltavica* Lipsky, segregated by Lipskii and reported to have leaves tomentose on both sides and approximate semiverticels, is of no taxonomic significance since such forms also occur in other parts of the distribution area and are linked with the typical form by numerous intermediate forms.

Section 4. **Macronepeta** Benth. Lab. gen. et sp. (1834) 467, 482, p.p. (quoad typ.). — *Nepeta* § *Macronepetae* Briq. in *Pflanzenfam.* IV, 3a (1897) 237, p. p. — Calyx tubular, curved, with oblique throat; corolla medium-sized or large (1.4-3.5 cm long), with narrow curved tube abruptly expanding into wide neck, the narrow part of tube half as long again as calyx; middle lobe of lower lip with flat drooping lobules; nutlets smooth. High perennial plants, distributed mainly in East and Middle Asia; two species occur in Central Asia.

Series 1. *Sibiricae* Pojark. — Corolla large, (17) 20-35 mm long, the dilated part of tube 5-9 mm long and as wide, the narrow part twice as long as calyx; flowers in distant few-flowered verticillasters; peduncles shorter than flowers; cauline leaves narrow, short-petioled, obliquely ascending.

In addition to the two Russian species, this series contains *N. koreana* Nakai (N. Korea), *N. subsessilis* Maxim. (Japan), *N. przewalskii* Pojark. (Hansu province in Central China) and *N. erecta* Benth. (W. Himalayas and Tibet).

28. *N. manchuriensis* S. Moore in *Journ. of Bot.* XVIII (1880) 5; Kom. Fl. Man'chzh. III, 354; Kom. and Alis. *Opred. rast. Dal'nevost. kraya*, II, 899.

- Perennial; root long, creeping, 5-7 mm across, woody, coarsely fibrous; rhizome not pronounced; stems to 1 m long, to 4-5 mm across, robust, erect, all or only in lower part dark purple, subglabrous below with sparse short simple hairs, in upper part densely covered with very fine glandular hairs interspersed with sparse spreading longer eglandular hairs, mostly simple, rarely with 1-2 pairs of mostly fertile axillary branches; leaves thin (chartaceous when dry) dark green above, glabrous or with sparse simple hairs, pale glaucescent beneath, densely beset, more densely on veins, with yellow punctate glands and sparse jointed eglandular hairs; secondary veins thin but prominent beneath; lower cauline leaves ovate, acute, the others lanceolate, to 15-16 cm long, 6-7 cm wide or narrowly lanceolate, to 15 cm long, 3.5-4 cm wide, with rounded-truncate or cuneate base, rarely obtuse, usually acute or acuminate, often narrowly apiculate, with acutely toothed margin, upper leaves sometimes entire; petioles of middle leaves 2-3 cm long (1/5-1/3 as long as blade), 3-
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5 mm long in upper leaves; lower floral leaves resembling upper cauline leaves but much smaller, the others small, narrowly lanceolate, much shorter than semiverticels, differing little from bracts; inflorescence of 4–7 verticillasters; upper semiverticels sessile, their pairs subremote to closely approximate, the lower on peduncles 0.4–3 cm long, 2–6 (9) cm apart; bracts narrowly linear, 4–7 mm long; pedicels to 1.5 mm long; calyx 8.5–9.5 mm long, completely covered outside (like pedicels and bracts) with very small glandular hairs, 15-nerved; teeth lanceolate, acuminate, the upper 2/5 times as long as tube, the lower narrower and longer; corolla 17–20 mm long, more or less densely covered outside with short glandular hairs; narrow part of tube exerted to 1/3, expanding above into wide neck 5–7 mm long; upper lip erect, 2.5–3.5 mm long, cleft to middle into ovate lobes; middle lobe of lower lip reniform, 3–4 mm long, 7–7.5 mm wide, broadly emarginate, with shallowly and coarsely sinuate-dentate margin, the lateral lobes triangular, 2–2.2 mm long, 2.8–3 mm wide; upper stamens slightly shorter than upper lip; nutlets 2.5–2.6 mm long, 1–1.2 mm wide, ellipsoid-obovoid, with a very faint edge on ventral side, brown. Fl. June–July; fr. August.

Pebbles of rivers and streams in mixed forests. — Far East: Uss. (only in southern part). Endemic. Described from Maritime Territory, from the Sea of Japan between 44 and 45°N. Type in London.

29. *N. sibirica* L. Sp. pl. (1753) 572 (excl. syn. Buxb.); P. Smirnov in Byull. Mosk. obshch. ispyt. priro. Otd. biol. XLVI, 2, 96. — *Dracocephalum sibiricum* L. Syst. nat. ed. X (1759) 1104; Sp. pl. ed. II, 830 (excl. syn. Buxb.); Bge. in Ldb. Fl. Alt. II 389. — *Nepeta macrantha* Fisch. Catal. hort. Gorenk. ed. 2 (1822) 22, nom. nud.; Benth. Lab. gen. et sp. 482, diagn.; Benth. in DC. Prodr. XII, 387; Ldb. Fl. Ross. III, 1, 378; Kryl. Fl. Zap. Sib. IX, 2307; O. and B. Fedch. Perech. rast. Turk. V, 143. — *Moldavica elata* Moench, Meth. (1794) 410. — *M. sibirica* Moench ex Steudel Nomenclat. bot. ed. 1 (1821) 153. — Ic.: Pall. Fl. Ross. tab. 113; Bot. Mag. tab. 2185. — Exs.: Smirnow, Pl. alt. exs. No. 71.

343 Perennial; 60–100 cm high; root long, creeping, woody, forming some suckers, splitting at the end into coarse fibers; stems 40–100 cm long, slender, to 6 cm across at base, obtusely 4-angled, sparsely covered with hairs interspersed with small scablike sessile glands, usually densely glandular beneath inflorescence, often reddish in lower part, simple or branching all the way up from base; axillary branches long, fertile; leaves lanceolate or ovate-lanceolate, gradually acuminate above, with cordate or rarely truncate base; cauline leaves 5–15 cm long, 1–6 cm wide, evenly serrate or dentate or crenate-dentate, glabrous or sparsely covered above with small sessile capitate glands, with numerous punctate yellow glands beneath, the lower with petioles 1/7–1/4 as long as blade, the upper with shorter petioles; lower leaves subtending inflorescence resembling cauline leaves, the upper linear-lanceolate, 7–15 mm long, entire; inflorescence consisting of 3–8 remote verticillasters forming a loose raceme; lower peduncles to 2 cm, the upper 2–3 mm long; pedicels 1.5–2.5 mm long; bracts linear to nearly subulate, slightly longer than pedicels; all parts of inflorescence except corolla completely covered with sessile or short-stipitate glands intermixed with simple villous spreading hairs; calyx 9.5–14 (15) mm long, usually blue, the throat strongly oblique, the 3 upper teeth triangular or lanceolate-triangular, 2/7–1/3 as long as tube, the 2 lower narrower and longer, 2/3 as long as tube, all acuminate; corolla 2.5–3.5 (4) cm long, azure-blue, with dark spots on lower lip, sparsely pubescent outside; tube exerted nearly to the middle, narrow, gradually and slightly dilated above and then

abruptly passing into neck, (5.5) 7-9 mm long, (6) 8-10 mm wide; upper lip cleft beyond middle into elliptic obtuse lobes; middle lobe of lower lip reniform, 4-7.5 mm long, 6-8.5 mm wide, deeply emarginate, with coarsely crenate-incised margin, the lateral lobes triangular or ovate-triangular or ovate, 2.5-3.5 mm long, 3.5-5.5 mm wide; upper stamens slightly shorter than upper lip; style as long as upper lip; nutlets elongate-obovoid, 2-2.6 mm long, 1-1.75 mm wide, grayish-ocherous, with prominent edge on ventral side. Fl. July-August; fr. from August.

A mountain plant growing at altitudes of 500-1200 m along banks of mountain rivers and streams, steppe meadows, wastelands, meadow and stony slopes, rarely broadleaved forests, usually a weed growing near habitations. — West Siberia: Alt.; East Siberia: Ang.-Say., western part (near Kansk, Western Sayans, Tannu-Ola Range); Centr. Asia: Dzh.-Tarb. (Saur and Tarbagatai mountains). **Gen. distr.:** Dzh.-Kash. (northeastern part), Mong. (Mongolian Altai, Khangai, Gobi Altai). Described from cultivated specimens of Siberian origin from the Botanical Garden in Upsala. Type in London.

Notes. 1) This species is known in the botanical literature under the name *N. macrantha* Benth. or *N. macrantha* Fisch. ex Benth. All authors, commencing with Bentham and Ledebour, included *Dracocephalum sibiricum* L. in the synonymy of this name, citing the second edition of "Species plantarum" (page 830), although in the first edition of this work (page 572), Linnaeus described *Nepeta sibirica* L. and later in the 10th edition of "Systema naturae" and in the second edition of "Species plantarum" merely transferred his species to the genus *Dracocephalum*. He also included *N. sibirica* L. in the synonymy of *Dracocephalum sibiricum*, preserving word for word the diagnosis of *N. sibirica* and references to the literature. Hence the name *N. sibirica* L., restored by Smirnov, should be considered as valid.

2) *N. sibirica* occurs as an introduced plant in Lad.-Ilm. (vicinity of Leningrad and Tikhvin). Earlier authors (Pallas, Falk and Claus), as well as Ledebour, reported *N. macrantha* Benth. for many parts of southeastern Russia where apparently it also occurred as introduction and escape.

Economic importance. The aerial part of the plant yields about 0.15% essential oil that may be used in the perfume industry. An ornamental, flowering profusely for a long period. It has been known as a cultivated plant since 1750 and is easily naturalized.

Series 2. *Formosae* Pojark. — Corolla medium-sized, 14-18 (20) mm long; narrow part of tube exerted to about 1/3, the dilated part 3-5 mm long and wide; flowers in remote, more or less many-flowered, compound cymes; most peduncles much longer than cymes. Bright green plants, faintly covered with simple and glandular hairs.

One Central Asian species in this series.

30. *N. formosa* Kudr. in Bot. mat. gerb. Inst. bot. i zool. AN UzSSR, IX (1947) 15. — *N. grandiflora* auct. fl. turk.: O. and B. Fedch. Perech. rast. Turk. V, 146, non M. B.

Perennial; root creeping, woody, dense, passing above into branching rhizome; stems to 100 cm long, to 8 mm across, with internodes 5-13 cm long, green, covered, densely in upper part and sparsely below, with very short simple hairs and small sessile glands, usually branching nearly all the way up; lower axillary branches sterile, short, the others 5-40 cm

long, terminated by inflorescence; leaves thin (chartaceous when dry), bright green, much paler beneath; upper side rather densely covered with very small appressed hairs; lower side with similar hairs (longer on veins) and punctate yellow glands; lower and middle cauline leaves 4.5–14 cm long, 2.5–8 cm wide, ovate, cordate or nearly triangular-cordate, acute or acuminate, with subcordate or rarely slightly notched base, evenly crenate or crenate-dentate from base; upper cauline leaves and leaves of axillary shoots commonly narrower to ovate-lanceolate and frequently with rounded base; petioles puberulent, the lower leaves $\frac{2}{3}$ as long as blade, the upper much shorter; cymes mostly compound, many-flowered, the upper subsessile, crowded at summit of stem and of axillary branches, others on peduncles 1–3 cm long in remote pairs; aggregate inflorescence paniculate; lower floral leaves resembling cauline leaves, the upper bracteiform; bracts narrowly lanceolate to linear-subulate, $\frac{1}{3}$ as long as calyx; pedicels 1–1.5 mm long; calyx 6.5–9 mm long, green or violet, densely covered with very small, sessile and short-stipitate glands and, mainly on nerves and margin of teeth, with short spreading simple hairs; teeth triangular, rarely lanceolate, tapering to a point, the upper slightly longer than lower, $\frac{1}{4}$ – $\frac{2}{5}$ as long as tube; corolla 14–18 (20) mm long, lilac, pubescent and glandular outside, the narrow part of tube exerted to 2.5–3 mm; upper lip 3–3.5 mm long, erect, cleft to $\frac{1}{3}$ – $\frac{1}{2}$ into obtuse lobes; middle lobe of lower lip 3–3.5 mm long, 4.5–5 mm wide, coarsely crenate, emarginate, the lateral lobes ovate-triangular or triangular-ovate, 1.75–2.5 mm long and as wide; upper stamens with filaments as long as upper lip; style slightly longer; nutlets oblong-obovoid, 1.75–2 mm long, 0.75–1 mm wide, dark brown, obtusely 3-angled. Fl. first half of June–August; fr. July–September.

Mountain forests, mainly walnut and walnut-maple, fine earth enriched with humus, often in great profusion. — Centr. Asia: T. Sh. (Fergana, Chatkal, Kara-Tau ranges), Pam.-Al. (Alai, Zeravshan, Gissar, Vakhsh and Peter the First ranges). Endemic. Described from Fergana Range, between Charvak and Arslanbob villages. Type in Leningrad.

Notes. 1) In habit *N. formosa* is very much like the Caucasian *N. grandiflora* M.B. with which it was identified for many years, but the structure of the middle lobe of upper corolla-lip and the smooth nutlets indicate that there is no close relationship between these two species and that *N. formosa* is related to the E. Asian representatives of the section *Macronepeta*.

2) Apparently crossings of *N. formosa* Kudr. with *N. bucharica* Lipsky are very common. In habit they are intermediate between the two species, at times inclining more toward one or the other. Flowers in dense many-flowered compound cymes often resembling semiverticels or in semiverticels, these all in distant pairs or the upper forming a compact spike; corolla violet-bluish, the tube long-exserted; leaves of a thin consistency, sometimes recalling the leaves of *N. formosa*, sometimes more like those of *N. bucharica*, the lower surface puberulent or glabrous.

346 Series 3. *Gontscharovianae* Pojark. — Corolla large, 22–27 mm long; corolla-tube long, strongly curved, the narrow part exerted to $\frac{1}{3}$ or $\frac{1}{2}$, the dilated part 4–5 mm long and as wide; flowers in remote few-flowered but compact cymes, with short peduncles. Plants covered with gray hairs and densely beset with sessile capitate whitish glands.

Two Central Asian species in the southwestern part of Pamir-Alai.

31. **N. gontscharovii** Kudr. in Bot. mat. gerb. Inst. bot. i zool. AN UzSSR, IX (1947) 16.

Perennial; rhizome thick, woody, dark brown, beset with obtuse small scales; stems erect or ascending, 30–100 cm long, ca. 3 cm across, robust, with internodes 4–5 cm long, densely covered with small short-stipitate capitate glands forming a kind of a powdery bloom, in lower part also with loose whitish arachnoid-tomentose hairs, simple or in axils of middle leaves with short rudimentary leafy sterile branches and in upper part sometimes with 1–2 pairs of short slender leafy branches bearing inflorescence; lower leaves squamiform, brown, the others pale green, short-petioled (petioles $1/9$ – $1/6$ as long as blade), erect, partly parallel to stem, broadly ovate or the uppermost to oblong-ovate, all with deeply cordate or subhastate base, obtuse at apex, crenate or crenate-dentate along the whole margin, 3–4.5 cm long, 1.7–3 cm wide, densely covered above with short glandular hairs interspersed with long simple ones, rugose by impressed veins, gray-tomentose beneath, the tomentum nearly masking numerous short glandular hairs and round orange sessile glands, the veins thin but prominent; lower bracts resembling upper cauline leaves but slightly smaller, others much smaller, the uppermost bracteiform, narrowly lanceolate, ca. 5 mm long; inflorescence of 3–4 pairs of remote, few-flowered (3–8 flowers) but compact cymes with peduncles from 3 mm (upper) to 10 mm (lower); pedicels to 2 mm long; bracts lanceolate-subulate, 2–4 mm long, much shorter than calyx, densely covered with short glandular hairs, at margin with long simple hairs; calyx slightly curved, 8–10 mm long, with 15 thick prominent nerves, suffused with violet, very densely covered with small short-stipitate glands, the throat strongly oblique, nearly 2-lipped; upper teeth oblong-triangular, short-acuminate, $1/3$ as long as tube, the lower narrowly lanceolate, long-
347 acuminate, $2/3$ as long as tube, all teeth with coarse, sparse cilia; corolla 22–27 mm long (blue), sparsely hairy outside, tube slender, curved, exerted to half its length, abruptly expanding into neck, ca. 4 mm long, 5 mm wide; upper lip 4–5 mm long, cleft into broad lobes; lateral lobes of lower lip obliquely triangular-orbicular, 2 mm long, 3 mm wide, the middle lobe 3–4 mm long, 5.5–6 mm wide, broadly emarginate; upper stamens slightly exceeding upper lip; lower stamens and style slightly shorter than upper lip; nutlets ellipsoid, dark brown, 2.5 mm long, 1 mm wide. Fl. July. (Plate XXI, Figure 1.)

Subalpine belt, in meadows. — Centr. Asia: Pam.-Al. Endemic. Described from southern slope of Gissar Range, from Tuvish River (Tadzhik SSSR, Romitskii region) — thus far the only location recorded for this species. Type in Leningrad.

32. **N. consanguinea** Pojark. sp. nov. in Addenda XIX, 355.

Perennial, with thick woody root; rhizome undeveloped; stems erect, 65–100 cm long, ca. 5 mm across, strongly branching, densely covered, especially in upper part, with small sessile capitate whitish glands and spreading simple white hairs, these usually very dense and long in lower part; axillary branches long, fertile, producing in turn short fertile branches; several pairs of lower leaves brown, sessile, squamiform, others on petioles $1/5$ – $2/7$ as long as blade, spreading at an acute to nearly right angle, gray beneath with dense soft subvelutinous indument of short fine subappressed hairs, on both sides densely covered with capitate whitish sessile glands, and fewer round flat yellow glands, triangular-ovate, with deeply cordate base, gradually attenuate above, acute, rather coarsely crenate, rarely dentate-crenate, the middle largest, ca. 5–7 cm long, 3.5–4.5 cm wide, gradually smaller and sometimes narrower toward summit; floral leaves mostly resembling upper

cauline leaves, the uppermost bracteiform; flowers at ends of stem and axillary branches in remote 4–10 (12)-flowered compact cymes disposed in (3) 4–6 pairs and forming a narrow sparse raceme; upper cymes on peduncles to 5 mm long, the lower on slender straight peduncles to 2–2.5 cm long; leaves subtending cymes lanceolate-linear, 4–6 mm long; bracts similar but shorter, 3–4 mm; calyx 9–10 cm long, tubular, faintly curved, with 15 prominent nerves, very densely covered with capitate sessile glands, on nerves
348 with sparse simple spreading thick hairs; throat strongly oblique; teeth triangular, acuminate, the upper ca. 1/3 as long as tube, the lower much shorter; corolla 19–24 mm long, with slender tube exerted from calyx to 1/3–1/2, abruptly expanding into neck ca. 3.5 mm long, 5 mm wide; upper lip ca. 4 mm long, cleft to middle into broad lobes; middle lobe of lower lip 3.5–4 mm long, 6–7 mm wide, the lateral lobes obliquely ovate, 3 mm long, 3.5 mm wide; upper stamens as long as upper lip; nutlets unknown.

Stony, fine earth taluses, upper zone of wood and scrub belt. — Centr. Asia: Pam.-Al. Endemic. Described from Vakhsh Range, Sufan-Mir-Tau Mountain. Type in Leningrad.

Note. Very close to the preceding species from which, however, it is readily distinguished by the strongly branching stems, differently shaped patent leaves (not parallel to stem), with developed petioles; also by the shorter corolla-tube.

Section 5. **Cataria** Benth. Lab. gen. et sp. (1834) 466, 476, p. p. — *Nepeta* § *Stenostegiae* Boiss. Fl. or. IV (1879) 638, p. p. — *Nepeta* § *Macronepetae* Briq. in Pflanzfam. IV, 3a (1897) 237, p. p. non Benth. — Calyx in flower narrowly tubular, in fruit broader to ovate, with more or less oblique throat; corolla small or medium-sized (7.5–10 mm or 10–22 mm long), included in calyx to dilated part of tube or to limb, rarely the narrow part of tube slightly longer than calyx; middle lobe of lower lip markedly concave, the involute margin with several large teeth; nutlets more or less distinctly tuberculate or smooth; bracts narrow, much shorter than calyx; flowers in cymes or verticillasters forming racemiform or subpaniculate or spicate inflorescences. Perennials.

The distribution area of the section stretches from the Himalayas across Central Asia and encompasses SW Siberia, Middle Asia, nearly the entire Mediterranean region and the most southerly areas of Central and Eastern Europe.

Subsection 1. *Leiocarpace* Pojark. subsect. nov. in Addenda XIX, 356. — Sect. *Cataria* Benth. Lab. gen. et sp. (1834) 466, p. p. (quoad typ.) sensu Briq. in Pflanzfam. IV, 3a (1897) 237.

Type of subsection: *N. cataria* L.

Most species in this subsection occur in W. Himalayas and Afghanistan, very few in the Mediterranean region; *N. cataria* L. is distributed from the Himalayas to Western Europe.

Series 1. *Catariae* Pojark. — Calyx not strongly curved, ovoid in fruit, its upper teeth not differing in size from the rest; corolla small, to 10 mm long; flowers in many-flowered dense cymes at ends of stem and axillary branches forming oblong narrow racemes, these dense in upper part, often nearly spicate.

349 Among members of this series, *N. cataria* L. has apparently only one close relation — *N. atlantica* J. Ball. (Morocco).

33. *N. cataria* L. Sp. pl. (1753) 570; M. B. Fl. taur.-cauc. II (1808) 39; Benth. Lab. gen. et sp. 477; Ldb. Fl. Ross. III, 374; Boiss. Fl. or. IV, 643; Shmal'g. Fl. II, 312; Grossg. Fl. Kav. III, 293; idem, Opred. rast. Kavk. 331; Kryl. Fl. Zap. Sib. IX, 2309. — *N. minor* Mill. Dict. ed. VIII (1768) No. 2. — *Cataria tomentosa* Gilib. Fl. Lith. (1781) 78. — *C. vulgaris* Moench, Meth. pl. (1794) 387. — *N. vulgaris* Lam. Fl. Fr. II (1778) 398. — *N. macrura* Fisch. ex Spreng. Syst. veg. II (1825) 729; Benth. in DC. Prodr. XII, 395. — *Glechoma cataria* O. Ktze. Rev. gen. (1891) 518. — **lc.**: Rchb. Ic. Fl. germ. XVIII, tab. 1242; Fedch. and Fler. Fl. Evrop. Ross. (1910) 807; Syreishch. Fl. Mosk. gub. III, 87; Fl. Yugo-vost. VI, Figure 604. — Exs.: GRF, No. 27; Fl. pol. exs. No. 668; Sintenis, It. trans.-casp. an. 1900-1901, No. 668 and No. 812.

Perennial; root woody, branching; rhizome not evident; stems 40-100 cm long, robust, erect or ascending at base, covered with short soft pubescence of simple white reclinate hairs, branching; branches leafy, fertile, mostly short; leaves triangular-ovate, with cordate base, acute, large-toothed, covered on both sides with short hairs, much more densely so and hence grayish beneath, later sometimes glabrescent; cauline leaves 2-8 cm long, 1.2-4 (5) cm wide, all petiolate; petioles pubescent, the lower 2/3 as long as to slightly shorter than blade, the upper much shorter; lowermost (1-2 pairs) floral leaves resembling upper cauline leaves, others much shorter, entire, lanceolate, the upper small, bracteiform; flowers in dense compound cymes at ends of stem and branches forming a raceme; upper cymes few-flowered, dense, subsessile, generally crowded, the lower on peduncles to 1.5-2 cm long, more or less remote, many-flowered, looser; bracts linear-subulate, shorter than calyx; pedicels 1-1.5 mm long; calyx 5.5-7.5 mm long, slightly curved, densely grayish-puberulent, green or in upper part more or less violet, in flower narrowly tubular, in fruit ovoid, with 15 ribbed nerves; throat oblique; teeth lanceolate at base, abruptly tapering from middle to long subulate point, the upper (1/2) 2/3 as long as to rarely equaling tube, the lower about equaling the upper but longer in relation to tube; corolla 7.5-10 mm long, dingy white, with purple or violet spots on lower lip, rarely without them (f. *immaculata* Syr.); tube 3-4 mm long, slightly curved, not exerted from calyx, rather gently expanding above into neck 2-3 mm long, 2.5-3 mm wide; upper lip ca. 2 mm long, cleft to middle
350 into ovate lobes; lower lip twice as long as the upper, the middle lobe oblate, large-toothed, 2.5-3.5 mm long, 4-4.5 mm wide, involute-margined, the lateral lobes semiorbicular, 0.7-1 mm long, 1.3-1.5 mm wide; nutlets brown, ellipsoid, 1.3-1.5 mm long, 0.8-1 mm wide, smooth. Fl. last half of June-July; fr. from July.

Meadows, forest margins, forests, thickets, riverbanks, mainly weed-infested places, fields, orchards, gardens, ditches, meadow slopes of mountains in central mountain and subalpine belts. — European part: Balt., Lad.-Ilm., U. V., V.-Kama, U. Dnp., M. Dnp., V.-Don, Transv., U. Dns., Bes., Bl., Crim., L. Don, L. V.; Caucasus: all regions; West Siberia: U. Tob., Irt.; Far East: (Uss.) sometimes introduced; Centr. Asia: Ar.-Casp. (northern part — Mangyshlak, Ust Urt and outlier mountains), Balkh. (mountains), Dzu.-Tarb., Mtn. Turkm. (Kopet-Dagh), Pam.-Al., T. Sh. **Gen. distr.**: nearly all Europe but, except for east and south, only escaped or introduced; Med., Bal.-As. Min., Arm.-Kurd., Ind.-Him., Jap. (introduced), N. Am. (introduced). Described from Europe. Type in London.



PLATE XXI. 1 – *N. gontscharovii* Kudr., general aspect, flower; 2 – *N. longituba* Pojark., general aspect, flower, nutlet; 3 – *N. velutina* Pojark., lower and upper parts of inflorescence, leaf, flower, nutlet.

Note. Gynodioecism and gynomonoeism are observed at times in *N. cataria*. The female flowers are smaller than the bisexual and have four staminodes hidden in the dilated part of the tube.

Economic importance. The plant contains up to 3% essential oil that is used in the perfume industry; a form with a strong lemon odor, *f. citriodora* Dam., has been cultivated for years as a nectariferous plant. In Tashkent conditions (Tsukervanik, 1934) the aerial parts of this form yielded 0.15% essential oil which consisted of 13% citral, 8% limonene and dipentene, and about 80% alcohol. The alcohol fraction contained about 17% geraniol, 25% citronellol and about 38% innerol [?]. Decoctions of *N. cataria* are used in popular medicine in the treatment of colds, catarrhal gastritis, anemia and other ailments. There are indications that the roots of *N. cataria* contain substances that have a strong stimulating effect on the nervous system.

Subsection 2. *Tuberculatae* Pojark. subsect. nov. in Addenda XIX, 356.— Sect. *Cataria* Benth. Lab. gen. et sp. (1834) 466, pro min. parte. — Sect. *Macronepetae* Benth. l. c. 467, pro min. parte. — Nutlets tuberculate, sometimes very small.

353 Type of subsection: *N. grandiflora* M. B.

The habitats of the overwhelming number of species in the section lie in the countries of Southwest Asia and the Caucasus; several species occur in S. Europe.

Cycle 1. *Heterodontae* Pojark. — Calyx strongly curved, with strongly oblique nearly 2-lipped throat, oblong or tubular-ovoid in fruit, the uppermost tooth distinctly longer than adjoining teeth; corolla 10–15 mm long; nutlets with very small and very flat, pellucid tubercles; flowers in compound cymes forming a racemiform or paniculate, more or less pyramidal inflorescence.

The closest relations of the Caucasian species in this cycle are the Western Mediterranean *N. nepetella* L.s.l. (S. Europe), *N. amethystina* Desf. (SE Spain and *N. aurica* Guir. (Spain — Granada) which consist, however, of the phyletic series *Nepetellae* Pojark. that, in some characters, occupies a position between the cycle *Heterodontae* and the series *Cataria* and thus links the two subsections of the section *Cataria* in the range adopted here. *N. nepetella* L. has been reported for the south of the European part of the Soviet Union (partly under the synonymous name *N. graveolens* Vill.) but, if these reports are true, they can only refer to introduced plants.

34. *N. cyanea* Stev. in Mém. Soc. Nat. Mosc. III (1812) 265; Benth. Lab. gen. et sp. 478, p. p.; in DC. Prodr. XII, 383, p. p.; Ldb. Fl. Ross. III, 375, p. p.; N. Pop. in Tr. Bot. sada Yur'evsk. univ. XIV, 234, p. p.; Grossg. Opred. rast. Kavk. 332, p. p. — *N. incana* var. *cyanea* M. B. Fl. taur.-cauc. III (1819) 392. — ? *N. mollissima* Tausch in Flora, I (1831) 219. — *N. cyanea* var. *steveniana* Trautv. in Tr. Bot. sada, V (1877) 469; Lipsk. Fl. Kavk. 421; Grossg. Fl. Kavk. III, 295; Sosnovsk. Fl. Gruz. VII, 297.

Perennial, grayish or green, with dark brown woody fibrous root; stems 20–50 cm long, 2–4 mm across in lower part, densely covered in lower part with short appressed hairs, in upper part usually with longer spreading hairs, often downy-villous under inflorescence, branching or rarely nearly simple; middle internodes to 6–8 mm long; branches simple

(rarely with rudimentary secondary branches in axils of leaves), upright, often all short, the lower sterile, the upper terminating in inflorescence, rarely most of them long and fertile; leaves green, mostly not rugose, rarely rugulose, usually rather densely covered on both sides with coarse hairs, these appressed or subpatent beneath, interspersed, densely beneath and sparsely above, with punctate yellow glands; cauline leaves broadly ovate to oblong or lanceolate, 2–4.5 cm long, 0.8–2.5 cm wide, with truncate or cuneate base, obtuse or acute, the margin with distinct acute or obtuse teeth; petioles of lower leaves 1/3–1/2 as long as blade, those of upper leaves 1/8–1/6 as long; lower floral leaves resembling the upper cauline; upper floral leaves long-acuminate, entire, sessile; leaves subtending cymes linear-subulate; flowers at ends of stems and axillary branches forming a narrowly pyramidal or cylindrical panicle; upper part of panicle very dense, nearly spicate, consisting of several pairs of crowded semiverticels or cymes, the lower part composed of 2–4 pairs (on stem) or 1–2 (on branches) of remote cymes with peduncles 0.6–2 cm long; cymes compound, dense, outwardly resembling semiverticels; axes and pedicels short; bracts linear or subfiliform, 2–3 mm long; calyx 9–12 mm long, downy- or tomentose-villous with spreading blue (or white in lower part) long jointed (6–10 cells) hairs and beset with short-stipitate and sessile whitish glands, very strongly curved, the uppermost tooth narrowly lanceolate, long-acuminate, 2.8–4.2 mm long, reaching the base of upper lip of corolla, 2/5–1/2 as long as tube, the middle and lower teeth abruptly attenuate from broad base to porrect point, the middle 0.3–0.7 mm shorter than the uppermost, the two lower 2/3 as long; corolla (12.5) 13–15 mm long, included in calyx nearly to the limb, the neck 2.3–2.5 mm long, 3.5–4 mm wide; upper lip 3–3.5 mm long, cleft to middle or 2/3 into distally enlarged obtuse lobes 2.1–2.4 mm wide; lower lip with middle lobe 3–4 mm long, 5–6 mm wide, the lateral lobes semiorbicular-triangular, 1.8–2 mm long, 2.5 mm wide; upper stamens 1–1.5 mm shorter than upper lip of corolla; nutlets ellipsoid, 2.2–2.4 mm long, 1.1–1.2 mm wide, brownish-black in maturity, covered on both sides with rather large, flat, round, irregularly papilliform tubercles. Fl. June–first half of September; fr. from August. (Plate XXII, Figure 1.)

Central and subalpine, sometimes alpine, belts, 1250–3300 (4200) m, bluffs and taluses. — Caucasus: Main Range (eastern part), Dag. Endemic. Described from S. Dagestan, near Khinalug village. Type in Helsinki, topotypes in Leningrad.

Note. The taxonomic significance of *N. ruprechtiana* Boiss. (Fl. or. IV, 1879, 661), described from N. Dagestan (between Golotl' and Avarskoe Koisu River at an altitude of about 150 m), remains obscure. The authentic specimen of this species has many features in common with *N. cyanea* Stev. (shape and dentation of leaves, character of vesture, shape of calyx and its teeth, dense semiverticel-like cymes, sculpture of nutlets). The most significant feature distinguishing this species from *N. cyanea* is the corolla included in the calyx only to the base of the dilated part of the tube (not up to the limb). It must also be noted that *N. ruprechtiana* was collected in the lower mountain belt where *N. cyanea* does not occur. There are specimens near Gunib, at altitudes of 1200–1500 m, that resemble *N. ruprechtiana* in essential features. More material and investigations of this species in nature are required.

35. *N. kubanica* Pojark. in Addenda XIX, 356. — *N. incana* C. A. M. Verzeichn. Pfl. Cauc. kasp. Meer. (1831) 92, p. p. non Sol. nec M. B. — *N. cyanea* auct. fl. cauc. non

Stev. — *N. cyanea* var. *steveniana* Lipsky in Sched. herb. Fl. Ross. No. 934, non Trautv. — Exs.: GRF, No. 934.

Perennial; stems 30–55 cm long, robust, erect, densely covered all over with very short appressed crisp hairs, purple in lower part, 2.5–4.5 mm thick, branching from base; internodes 15–17, the lower and those in inflorescence short, others 4–8 cm long; lower branches often short, sterile, the upper bearing inflorescence of 3–5 pairs of cymes, these subequal, usually much shorter than stem; leaves yellowish-green, concolor, covered with very short and fine (magnifying glass!) appressed hairs and beset, very densely beneath, more sparsely above, with punctate glands, the thick nerves prominent beneath; cauline leaves 2–5.5 cm long, 0.5–1.2 cm wide, oblong, lanceolate or narrowly lanceolate, cuneate at base, gradually tapering to acute apex, the margin with acute teeth; upper cauline leaves and leaves of axillary branches often entire; petioles ca. 2/9 as long as blade, the upper shorter; lowermost floral leaves resembling the cauline, others small, ovate, entire, the uppermost and those subtending cymes bracteiform; cymes 5–13-flowered, 5–9 pairs at the end of stem and axillary branches forming lax cylindrical or sometimes subpyramidal panicles, the upper peduncles 3–7 mm long, the lower 2.5–3 cm long; most cymes twice loosely dichotomously branching, the axes of first order sometimes forming a short 3–5-flowered bostryx; pedicels 0.3–0.8 mm long, only in bifurcation of cyme 2–2.5 mm long; bracts linear, 1.5–2.5 mm long; calyx 6–7.5 (8) mm long, more or less blue-tinged, puberulent and beset with scattered whitish and yellow sessile glands; uppermost tooth narrowly lanceolate, 1.5–2 (2.5) mm long, usually barely reaching the base of neck of corolla-tube or even shorter, the middle and lower teeth abruptly attenuate from broad base to a point, the middle slightly shorter than the uppermost, the lower 2/3 as long; corolla 11–12 mm long, in dry condition with bluish spots on upper lip and on lateral lobes of lower lip, the middle lobe purple-blue or blue, the narrow part of tube often exerted to 0.2–1 mm, the neck ca. 2 mm long, 3 mm wide; upper lip 2–2.5 mm long, cleft to middle or beyond into broad, sometimes nearly semiorbicular lobes; middle lobe of lower lip 2.5–4 mm long, 4–6 mm wide, the lateral lobes broadly triangular, obtuse, 1.2–1.8 mm long, 2–2.5 mm wide; upper stamens as long as upper lip; nutlets ellipsoid, with an obscure edge on convex ventral side, blackish-brown in maturity, covered with small flat tubercles, 2–2.2 mm long, 1–1.2 mm wide. Fl. and fr. July–August.

Central mountain belt, 1200–2000 m, exposed stony slopes, taluses, limestone outcrops, thorny thickets and pine forests. — Caucasus: W. Transc. and western part of Main Range. Endemic. Described from near Madniskhevi village at upper reaches of Kuban' River. Type in Leningrad.

Note. *N. kubanica* differs outwardly from *N. cyanea* Stev., with which it used to be confused, by its long, virgate axillary branches, narrower leaves, different indument, smaller flowers, and the comparatively lax, few-flowered, remote cymes.

36. *N. czegemensis* Pojark. sp. nov. in Addenda XIX, 357.

Perennial, with coarsely fibrous woody root; stems 30–50 cm long, 2–3 mm thick, ascending at base, often more or less curved, densely grayish-pubescent with very short appressed reclinate hairs, branching mostly from base, the middle internodes 4–7 cm long; branches varying in length without apparent pattern, all fertile or the lower sterile; leaves thin, grayish, densely covered with very short (magnifying glass!) appressed hairs, with

punctate yellow glands (more copious beneath), smooth, the thin veins not prominent beneath; cauline leaves 1.8–3 cm long, 0.9–1.5 cm wide, oblong-ovate to lanceolate, with truncate or rarely cuneate base, obtuse or acuminate at apex, each margin with 5–10 inconspicuous teeth, these acute or obtuse, sometimes distant; petioles $1/4$ – $1/3$ as long as blade; lower floral leaves resembling cauline leaves or broadly ovate, equaling or exceeding peduncles, abruptly decreasing in size and bracteiform above; leaves subtending cymes and bracts linear or lanceolate-linear, 2–3 mm long; cymes on stem 5–8 (12) pairs, on lateral branches fewer (2–6), the upper 2–6-flowered on peduncles 5–8 mm long, loosely
 357 approximate, the lower 2–4 cm distant, many-flowered, dichotomous or trichotomous, on peduncles to 4 cm long; aggregate inflorescence a loose oblong panicle; calyx (6.5) 7–8.5 mm long, densely villous with long blue, rarely white implexed hairs, oblong-ovoid in fruit, the median tooth slightly larger than lateral teeth, 1.5–2.5 mm long, lanceolate, acuminate, $1/4$ – $1/3$ ($2/5$) as long as tube, lateral and lower teeth subequal, with broad base, abruptly attenuate to a long point; corolla 11–12 mm long, with whitish tube included in calyx to base of dilated part (neck); upper lip 2–3 mm long, cleft to middle into obtuse lobes 1.7–2 mm wide; lateral lobes of lower lip obliquely semiorbicular, 1.2–1.5 mm long, 1.8–2 mm wide, like upper lip purple-spotted, the middle lobe in dry condition blue, 4.5–5 mm long, 6–7 mm wide; nutlets brown, 2–2.3 mm long, 0.8–1 mm wide, oblong-ellipsoid, 3-angled, rounded above, pointed at base, dull, finely punctate with rather sparse flat tubercles. Fl. July–August; fr. from second half of August.

Central mountain belt 1700–2500 m, mountain-steppe plant communities, pine forests, stony taluses. — Caucasus: Main Range, upper part of western tributaries of Terek River (Baksan, Chegem and others). Endemic. Described from Chegem River north of Bulungu village. Type in Leningrad.

37. **N. biebersteiniana** (Trautv.) Pojark. sp. nov. — *N. incana* M. B. Fl. taur.-cauc. II (1808) 60, non Soland in Ait. — *N. incana* var. *acinifolia* M. B. Fl. taur.-cauc. III (1819) 392 (non *N. acknifolia* Spreng.). — *N. incana* var. *cyanea* C. A. M. Verzeichn. Pfl. Cauc. kasp. Meer. (1831) 92, p. p. non Sol. nec M. B. — *N. cyanea* auct.: Benth. Lab. gen. et sp. (1834) 478, p. p.; in DC. Prodr. XII, 384, p. p.; Ldb. Fl. Ross. III, 375, p. p.; Boiss. Fl. or. IV, 656, p. p.; N. Pop. in Tr. Bot. sada Yur'evsk. univ. XIV, 234, p. p.; Grossg. Opred. rast. Kavk. 332, p. p. non Stev. — *N. cyanea* var. *biebersteiniana* Trautv. in Tr. Bot. sada, V (1877) 470; Lipsk. Fl. Kavk. 421; Grossg. Fl. Kavk. III, 295; Sosnovsk. Fl. Gruz. VII, 297. — **IC.**: Rchb. Ic. bot. tab. CCCV, fig. 478.

Perennial, strongly branching, grayish or whitish all over with dense short hairs; root woody, fibrous, more or less twisted, to 2 cm thick, branching; stems 20–50 cm long, 1.5–3 mm thick, densely covered with very short crisp appressed hairs (sometimes slightly spreading in upper part), with numerous (to 20) internodes 1.3–3.3 (4) cm long, branching from base; axillary branches leafy; all branches fertile, more or less branching, arcuately curved, the lower long, often as long as stem, others gradually shorter toward stem
 358 summit, hence the ends of axillary branches apparently equidistant from stem; leaves covered on both sides with very short yellowish or grayish hairs, often nearly tomentose and on both sides, more densely beneath, with yellow punctate glands, usually rugose with veins impressed above and prominent beneath; cauline leaves 9–30 (40) mm long, 6–25 (35) mm wide, oblong, ovate-oblong or lanceolate, obtuse or acuminate, with cuneate or

rarely truncate base, the margin with small appressed teeth; lower petioles 2/5–2/3 and of upper about 2/7 as long as blade; leaves on axillary branches smaller and often narrower; lower floral leaves resembling cauline leaves, others smaller, acuminate, entire, the upper (also leaves subtending cymes) bracteiform; all floral leaves, except the uppermost, longer than peduncles; flowers in 3–9-flowered cymes at ends of stem and axillary branches forming sparse racemiform or paniculate inflorescences; peduncles from 0.3–1.5 cm (the upper) to 1.5–2.5 cm long; most cymes dichotomous or trichotomous, the axes of the first order mostly forming a short bostryx; pedicels 0.3–1.3 mm long; bracts ovate-lanceolate or lanceolate, 1.5–2.5 mm long, acuminate; calyx 8–11 mm long, densely and uninterruptedly covered with whitish or bluish appressed antrorse hairs, rarely puberulent, beset with sessile or short-stipitate whitish glands; teeth tapering to a long nonspinescent point, the uppermost 2–3 mm long, 1/2–2/3 as long as tube, the two lower shortest, 0.8–1 (2) mm long; corolla 10–13 mm long, whitish with violet-reddish lower lip, puberulent, included in calyx nearly to the limb; tube abruptly expanding into neck 2.2–2.7 mm long, 2.7–3.5 mm wide; upper lip 2.8–3 mm long, cleft to middle into obtuse distally enlarged lobes; middle lobe of lower lip 2.5–3.5 mm long, 3.5–5.5 mm wide, the lateral lobes broadly triangular, 0.6–1.2 mm long, 1.8–2.7 mm wide, all with dark purple spots; nutlets ellipsoid-obovoid, brown, 2.2–2.5 mm long, 1–1.2 mm wide, convex on ventral side but without rib, obscurely tuberculate, the flat tubercles minute, almost punctate. Fl. June–July; fr. second half of June to August.

Middle and lower mountain zone, 150–2000 m, exposed gravelly and stony slopes, and mountain-steppe plant communities. — Caucasus: Cisc. (vicinity of Stavropol', basins of Kuma, Terek and Ardon rivers), Dag. Endemic. Described from S. Dagestan, Akhta village. Type in Leningrad.

Note. *N. biebersteiniana* has so far been considered a variety of *N. cyanea*. There are, however, good reasons for classifying it as a species. Morphologically, it is readily distinguishable from *N. cyanea* by a number of characters (habit, character of branching, shape of leaves, indument, shape of inflorescence, color of corolla, sculptural details of nutlets). The occurrence of specimens from Dagestan (apparently of hybrid origin) that gravitate toward *N. cyanea*, mainly as regards indument, does not alter the fact. Moreover, the distribution areas of the two species overlap to some extent only in Dagestan, and this incompletely since *N. biebersteiniana* is associated with the lower mountain zone, ascending to the middle zone, whereas *N. cyanea* occurs mainly in the high-mountain zone and does not descend below the middle zone.

Series 2. *Grandiflorae* Pojark. — Calyx curved, with distinctly but moderately oblique throat; lower teeth slightly smaller than the upper; corolla (14) 15–18 mm long, included in calyx to the base of dilated part of tube; nutlets inconspicuously and unevenly foveolate-tuberculate, the tubercles small and flat; flowers in many-flowered cymes forming loose racemes at the ends of stem and axillary branches. High, strongly branching plants, with cauline leaves more or less horizontally spreading.

Monotypic series.

38. *N. grandiflora* M. B. Fl. taur.-cauc. II (1808) 42; Ldb. Fl. Ross. III, 376; Boiss. Fl. or. IV, 659; Lipskii, Fl. Kavk. 421; N. Pop. in Tr. Bot. sada Yur'evsk. univ. XIV, 234;

Grossg. Fl. Kavk. III, 295; idem, Opred. rast. Kavk. 331. — *N. grandiflora* var. *glabrata* N. Kusn. in Uch. zap. Yur'evsk. univ. 2 (1899) 46, p. p. — *N. melissaefolia* Pers. Synops. 2 (1807) 115, non Lam. — *N. colorata* Willd. Enum. pl. II (1809) 601. — **lc.**: Fl. Gruz. III, Fig. 320; Hegi, III. Fl. V, 4, fig. 3249, a-b. — Exs.: GRF, No. 1083.

A high perennial; root oblique, slender, woody, tough, without tuberiform swellings; stems few or solitary, 50–150 cm long, (1.5) 3–6.5 mm thick, erect, strongly 3-angled, rather densely puberulent below inflorescence, subglabrous or with few hairs below, branching from base or only in upper part, rarely simple; lower axillary branches short, sterile, the others fertile, (3) 5–35 cm long, some branching; leaves thin, the cauline to 8 cm long, 4.5 cm wide, ovate or oblong-ovate to sublanceolate, mostly with cordate base, acute, crenate-dentate, dark green above, rather sparsely covered with short hairs, glaucescent beneath, more densely puberulent; lower petioles to 15–20 mm long, the upper 2–3 mm long; cymes mostly compound, of fewer flowers at ends of stem and upper axillary branches, in loose elongate racemes forming a paniculate aggregate inflorescence; peduncles 2–3 (5) cm long, the upper approximate; lower floral leaves resembling the cauline; upper floral leaves and leaves subtending cymes lanceolate-linear, bracteiform; bracts linear or nearly subulate, $1/4$ – $1/3$ as long as calyx, bluish-violet, ciliolate, covered with small glands; calyx (8.5) 9.5–10.5 mm long, violet-blue, densely covered with very fine capitate glands, with very short spreading or more or less appressed simple hairs along nerves; teeth narrowly triangular or triangular, acuminate or acute, $1/3$ – $1/2$ as long as tube; corolla (14) 16–18 mm long, violet-blue, pubescent, the narrow part of tube not exerted, the neck elongate; upper lip 2.5–3.5 mm long, cleft to $1/3$ – $1/2$, the lobes obtuse, distally enlarged; middle lobe of lower lip 4–7 mm long, 7–8.5 mm wide, coarsely toothed, the lateral lobes broadly triangular, 2.5–3 mm long, 1.3–1.5 mm wide; upper stamens and style slightly longer than upper lip; nutlets broadly ellipsoid, 3-angled, 1.75–2 mm long, 1–1.25 mm wide, dark brown, with sparse irregular flat tubercles. Fl. last half of June to August; fr. from first half of July.

Subalpine meadows and tall-grass stands, often very abundant; rarely wood margins and glades in the forest belt, meadow-steppe slopes. — Caucasus: Cisc. (W. and E.), Dag., W., E. and S. Transc. Endemic. Occurring as an escape in many parts of the RSFSR and in the Ukraine, also Centr. Europe. Described from the Caucasus. Type in Leningrad.

Note. *N. zangezura* Grossh. (in Beihefte Bot. Centralbl. XLIV, 2, 1928, 234), which was described from Migry, at the southern end of the Zangezur Range in Armenia, is very closely allied to *N. grandiflora*. A comparison of one of the original herbarium specimens with a plant collected in Migry and cultivated in the Armenian botanical garden (Erevan) revealed that, morphologically, *N. zangezura* can just be distinguished from *N. grandiflora* by the following characters: smaller calyx covered with shorter, coarser hairs, the broadly triangular teeth $1/5$ – $1/4$ as long as the tube (similar shape and size ratio may be occasionally observed in *N. grandiflora*); racemes more contracted. A reported difference in color of corolla (pale blue) has not been confirmed: in nature the Migry plant has a violet-blue corolla. It should be borne in mind that *N. zangezura* occurs under completely different ecological conditions — open xerophilous forests of *Quercus araxina* in the lower mountain belt — and also that its distribution area is apparently disjunct from that of *N. grandiflora*. It is therefore important to determine the taxonomic position of *N. zangezura*. There is need for more material and study in natural conditions.

Economic importance. Sometimes cultivated as an ornamental; easily naturalized. The essential oil of this plant is apparently of no value.

- 361 Series 3. *Betonifoliae* Pojark. — Calyx slightly curved, with slightly oblique throat and subequal teeth; corolla 15–23 mm long, the narrow part of tube exceeding calyx by 1.5–2.5 mm; nutlets with sparse flat tubercles; verticillasters dense, crowded at summit of stem in a dense spicate inflorescence (the lower 1 or 2 sometimes distant); stems few, simple; leaves short-petioled, upright.

This series consists of the three species described below.

39. *N. betonicifolia* C. A. M. Verzeichn. Pfl. Cauc. kasp. Meer. (1831) 92; Ldb. Fl. Ross. III, 374; Boiss. Fl. or. IV, 658; Lipsk. Fl. Kavk. 421; Grossg. Fl. Kavk. III, 294, p. p.; idem, Opred. rast. Kavk. 332, p. p.

- Perennial, gray-pubescent; rhizome creeping, slender, woody, tough, with internodes ca. 1 cm long, at nodes bearing small dark brown squamiform leaves; stems 25–40 cm long, gradually ascending, 3–5 mm thick, simple, densely leafy, sharply 4-angled, thickened along ribs, densely covered all over with fine crisp hairs, almost tomentose in upper part; leaves upright, firm, gray-pubescent on both sides, with fine flexuous 3–5-jointed hairs, densely beset beneath with very small round brownish glands; cauline leaves to 3.5 cm long, 2 cm wide, the lower sometimes exceeding internodes, mostly oblong-ovate (the lower sometimes ovate), with cordate base and obtuse apex, the upper narrower, ovate-lanceolate, acute; all leaves evenly toothed from base, rarely crenate, with 14–17 (20) teeth on each margin, the lower leaves with petioles 5–12 cm long, others with petioles 2–3 mm long or sessile; verticillasters dense, crowded at summit of stems in a firm ovoid or slightly elongate cylindrical spicate inflorescence 3.5–6 cm long and 2.5–4 cm wide, 1 lower verticillaster sometimes remote; semiverticels sessile or sometimes 1 or 2 lower pairs on short peduncles 2.5–3.5 mm long; lower floral leaves lanceolate, sessile, with cuneate base, acutely toothed to nearly entire, 12–22 mm long, 5–11 mm wide, the upper bracteiform, linear, 10–12 mm long, 1–1.5 mm wide; bracts narrowly linear, the outer 5–8 mm long, the inner 3–4 mm long, 2/5–1/2 as long as calyx, long-hairy, sometimes violet; calyx 8.5–10 mm long, slightly curved, with scarcely oblique throat, 15-nerved, densely arachnoid-tomentose, with very fine implexed long 4–6-cellular white hairs, violet in upper part; teeth lanceolate or oblong-triangular from middle, rarely long-acuminate, 362 subequal, 1/3–2/5 as long as tube; corolla 18–20 mm long, densely white-pubescent outside, the slender curved tube distinctly (2–2.5 mm) exserted from calyx, abruptly expanding into neck 3–3.5 mm long, 4 mm wide; upper lip ca. 3 mm long, cleft to the middle into obtuse lobes; lower lip twice as long as the upper, the middle lobe 3.5 mm long, 5 mm wide, the lateral lobes broadly triangular, asymmetrical, 1.25–1.5 mm long, 2.5–3 mm wide; upper stamens with filaments exceeding upper lip of corolla by 0.5–1 mm, filaments of lower stamens equaling it; style slightly longer than upper lip of corolla; nutlets (immature) oblong-obovoid, with sparse flat tubercles. Fl. and fr. July.

Subalpine meadows. — Caucasus: Tal. **Gen. distr.:** likely to occur in the part of N. Iran bordering on Talysh. Described from Talysh mountains. Type in Leningrad.

40. *N. somkhetica* Kapell. in Vestn. Tifl. bot. sada, nov. ser. 5 (1931) 35; Grossg. Fl. Kavk. III, 295; idem, Opred. rast. Kavk. 331. — *N. grandiflora* var. *glabrata* N. Kusn. in Uch. zap. Yur'evsk. univ. 2 (1899) 46, p. p. — *N. grandiflora* f. *simplex* Lipsky in Gerb. russk. fl. (1902) No. 1082. — *N. grandiflora* auct.: *N. Pop.* in Tr. Bot. sada Yur'evsk. univ. XIV (1914) 234, p. p. non M. B. — Exs.: GRF, No. 1082.

363 Perennial; root woody, coarsely fibrous, with numerous distant, often fusiform swellings; rhizome short, horizontal; stems erect or ascending, 35–100 cm long, 2–3.5 mm thick, simple, with 8–10 internodes (not counting inflorescence), more or less densely covered with very short simple 1–3-jointed hairs, these slightly longer at nodes and on lower internodes; upper internodes (4) 7–10 cm long; leaves thin, not rugose, upright, the upper parallel to stem, oblong-ovate, with cordate base (the upper often with nearly truncate base, narrower to lanceolate), acute, rarely obtuse, with 15–17 large obtuse or acute teeth on each margin, dark or bright green above, paler beneath, sparsely covered on both sides with short simple hairs, these appressed above, more or less spreading on lower side, especially along veins, interspersed with punctate yellow glands; largest leaves at middle part of stem 4–9 cm long, 1.5–4 cm wide; lower petioles 1/3–1/2 as long as blade, the middle and upper shorter; uppermost leaves sessile; lower floral leaves resembling the cauline but smaller, long-acuminate, few-toothed, the upper lanceolate-linear to linear-subulate, bracteiform; leaves subtending semiverticels and bracts narrowly linear, mostly conduplicate and then subaristate, green or lilac, hairy, 10 mm and 3–5 mm long, respectively; pedicels 0.3–1 mm long; verticillasters very dense, many-flowered, all or the upper tightly crowded in ovoid, rarely cylindrical, spicate inflorescence 4–7 cm long, 2–4.3 cm wide; 1–2 (3) lower pairs of semiverticels sometimes remote, with peduncles 3–10 (15) mm long; calyx 8–10 mm long, slightly curved and dilated in upper part, very prominently 15-nerved, densely covered with antrorse hairs, these short, appressed, in lower part longer and spreading; teeth oblong-triangular, long-acuminate, 1/4–1/3 (2/5) as long as tube; corolla 18–23 mm long, bluish-lilac, whitish-hairy outside, the tube exerted to 2–3 mm, abruptly expanding into large neck, 4–5 mm long and as wide; upper lip cleft to 1/3–1/2 into orbicular-obovate lobes; middle lobe of upper lip 4.3–5 mm long, 6.5–7 mm wide, rounded-truncate, the lateral lobes semiorbicular-triangular, 1.3–1.7 mm long, 2.7–4 mm wide; upper stamens mostly somewhat shorter than upper lip; nutlets oblong-ellipsoid, 2–2.5 mm long, 1–1.3 mm wide, brown, obscurely foveolate-tuberculate, nearly smooth in places, with papilliform apical protuberances sometimes coalescent into a coriaceous appendage and with 3–5 oblong dark ribs on the back. Fl. June to first half of August; fr. from second half of July.

From upper forest to alpine belt, meadows, tall-grass ranges, forest margins. — Caucasus: W. Transc. (upper reaches of basin of Kubana River), E. and S. Transc. Endemic. Described from vicinity of Sanain in Georgia. Type in Tbilisi.

41. *N. grossheimii* Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 310. — *N. betonicaefolia* Grossh. Opred. rast. Kavk. (1949) 330, p. p. non C. A. M.

Perennial; root woody, twisted, splitting into coarse fibers, passing above into short rhizome; stems few, 15–40 cm long, 1.7–3.5 mm across, erect or slightly ascending, unbranched, green or slightly violet-tinged, rather densely covered with short flexuous subaccumbent hairs, with 7–9 internodes (to inflorescence) of which the longest (the upper)

4–7.5 cm long; leaves upright (in herbarium often all or most parallel and appressed to stem), bright green, almost concolor, sparingly or rather densely covered with very fine short 3–5-jointed simple hairs and beset beneath with punctate glands, triangular-ovate or oblong-ovate (the upper sub lanceolate), with deeply cordate base, acute (rarely some obtuse), each margin with (11) 13–15 large teeth, these mostly acute, rarely subobtuse; middle leaves largest, 2.5–4.8 cm long, 1.8–2.7 cm wide; lower petioles ca. 2/3 as long to as long as blade, the middle short, the upper sessile; lower floral leaves resembling the cauline but smaller and narrower, lanceolate, acuminate, with fewer more acute teeth or partly entire, the upper lanceolate-linear, narrow, completely resembling bracts; inflorescence 4.6–11 cm long; semiverticels dense, many-flowered, the lower 1 or 2 on peduncles 0.5–1 cm long, 1–3 cm apart, the others subsessile, tightly crowded in a dense ovoid or cylindrical spike 2–3 cm wide; bracts narrowly linear, nearly setiform, 1/2–2/3 as long as calyx, violet, densely covered outside and along margin with long fine soft (5) 8–10-jointed white hairs; pedicels 0.5–1 mm long; calyx 7–8.5 mm long, violet, with narrow distally dilated tube and slightly oblique throat, densely covered in lower part with nearly straight long spreading white hairs, in upper part with shorter antrorse hairs, also beset with sparse minute sessile white glands; teeth subequal (the lower sometimes narrower), triangular, gradually or abruptly acuminate, corolla 15–17 mm long, bright, bluish-violet, densely white-puberulent outside, the tube exerted to 1.5–2 mm, abruptly expanding into neck 3–4 mm long and as wide; upper lip 3–3.5 mm long, cleft slightly beyond middle into suborbicular lobes; middle lobe of lower lip twice as wide as long, its margin with several large triangular teeth, the lateral lobes triangular-semiorbicular, 1.5–2 mm long, 2.8–3.3 mm wide; style slightly longer than upper lip, the upper stamens slightly shorter; nutlets unknown. Fl. end of May to first half of July. (Plate XXIII, Figure 1.)

Meadow slopes in upper belt of xerophilous open woodland. — Caucasus: S. Transc. (Zangezur Range). Endemic. Described from western slope of Zangezur Range below Bichenakh mountain pass. Type in Leningrad.

Series 4. *Strictifoliae* Pojark. — Calyx scarcely curved, with slightly oblique throat and subequal teeth; corolla 13–18 mm long; narrow part of tube barely exerted; nutlets with dense but isolated distinct tubercles; bracts linear-lanceolate to setiform, conduplicate and curved; verticillasters remote, the upper largest, loosely approximate, not confluent; stems solitary or few, nearly always simple; leaves upright, more or less parallel to them.

365 In addition to the Transcaucasian species, this series contains *N. elbursensis* Rech. fil. (N. Iran — Elburz Range), *N. speciosa* Boiss. et Noë (S. Kurdistan), *N. glabrescens* Boiss. (Arm.-Kurd. — southern spurs of Bimğel mountains) and *N. concolor* Boiss. et Heldr. (southeastern part of Asia Minor — Tavr Isaurskii).

42. *N. strictifolia* Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 303. — *N. betonicaefolia* Grossh. Fl. Kavk. III (1932) 294, p. p. non C.A.M. — *N. reichbachiana* Grossh. in Dokl. AN Azerb. SSR (1949) 70; idem, Opred. rast. Kavk. 332, p. p. non Fisch. et Mey.

Perennial; root woody, branching, rather slender; stems few (1–3), straight, sturdy,

upright, simple, very rarely with 1 or 2 pairs of leafy fertile branches in upper part, 35–80 cm long, 2–3.5 mm across, with 14–16 (18) internodes (including inflorescence) 5–10 cm long, at first densely covered with very short slightly crisp white hairs; leaves thin, not rugose, with prominent, upright or (especially the upper) parallel to stem, both sides densely covered with small (magnifying glass!) simple 2–3 (4)-jointed hairs and scattered punctate pale yellow glands, usually only the thin secondary veins prominent; middle leaves largest, 2.5–4.5 cm long, 0.8–2.3 cm wide, oblong-ovate or lanceolate, acuminate, rarely obtuse, with shallowly cordate or nearly truncate base, each margin with 10–13 large acute or subacute unequal teeth; lower petioles mostly short, rarely the longest 1/3 the length of blade, others still shorter; uppermost leaves sessile; only lowermost floral leaves resembling the cauline though smaller, the others linear-lanceolate, the upper almost setaceous, bracteiform; inflorescence lax, oblong, 5–18 cm long, consisting of 5–10 pairs of few-flowered semiverticels, the 2–4 lower 2.5–4 cm apart, with peduncles 4–10 mm long, the others loosely approximate (not confluent), sessile or subsessile; leaves subtending semiverticels and bracts violet, linear-setaceous, the first 5–8 mm, the second 3–5 mm long; pedicels 0.5–0.7 mm long; calyx 7–9 mm long, tubular, straight, with slightly oblique throat, with 15 prominent thick nerves, violet-blue, densely covered with short antrorse fine slightly crisp white hairs, subappressed on tube, spreading on teeth; teeth triangular-lanceolate, mostly gradually acuminate, 2/7–2/5 as long as tube, all equal or the 2 lower slightly narrower; corolla 14–16 mm long, bright violet-blue, densely covered outside with
366 mostly spreading fine hairs, these longer at outer side of limb; tube slender, exerted to ca. 1 mm, abruptly expanding into elongate neck, 3–3.2 mm long; upper lip cleft to middle into broad suborbicular lobes 2–2.5 mm wide; lower lip approximately twice as long as upper, the middle lobe 3.5–4.5 mm long, 5.5–7 mm wide, the lateral lobes triangular-semiorbicular, 1.3–1.5 mm long, 2–2.5 mm wide; upper stamens as long as upper lip of corolla; in a once encountered female specimen corolla with less developed lower lip, longer style and staminodes included in the enlarged part of tube; nutlets pale brown, oblong-obovoid, obtusely 3-angled, 1.8–2.3 mm long, 0.8–1.3 mm wide, with small remote obtuse tubercles. Fl. second half of May to June; fr. from first half of June. (Plate XXII, Figure 2.)

In the belt of xerophilous open woodland, on meadow and steppe slopes of northern exposure and in light forests. — Caucasus: S. Transc. (Nakhichevan ASSR, southern part of Armenia). **Gen. distr.:** Arm.-Kurd. (southern part of Kars). Described from Nakhichevan ASSR, Almabulak River. Type in Leningrad.

Notes. 1) Crosses *N. strictifolia* Pojark. × *transcaucasica* Grossh. encountered in the Nakhichevan ASSR comprise different combinations of features characterizing these well differentiated species, gravitating toward one or the other.

2) All the three Caucasian species which we have segregated in the series *Strictifoliae*, were erroneously referred by Grossgeim to *N. betonicifolia* C. A. M. in which, judging by his herbarium determinations, he also included *N. somkhetica* Kapell., although the latter species had at one time been nominally acknowledged by him. In 1949 he classified a complex of S. Transcaucasian forms as a species to which he quite inappropriately assigned the name *N. reichenbachiana* Fisch. et Mey. This species belongs to the cycle of forms allied to *N. mussinii* Spreng. and has little in common with species of the series *Strictifoliae*.

43. *N. alaghezi* Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 307. — *N. speciosa* E. Busch in Tr. Tifl. bot. inst. I (1933) 211, non Boiss. et Noë. — *N. reichenbachiana* Grossh. in Dokl. AN Azerb. SSR, V (1949) 70; idem, Opred. rast. Kavk. 332, p. p. non Fisch. et Mey.

Perennial, with woody branching root passing into short rhizome; stems few, erect, simple, 25–70 cm long, 1.5–2.5 cm across, covered with minute (magnifying glass!) 1–2-jointed thickish flexuous appressed simple hairs (in lower part longer, spreading); internodes 6–7 to inflorescence (including inflorescence 12–16), the upper 4–5 cm long; leaves 367 20–32 mm long, 0.9–2 mm wide, thin, not rugose, at least the upper upright, oblong-ovate, with cordate or subtruncate base (the lower often broadly ovate, with deeply cordate sinus), obtuse or sometimes acuminate at apex, each margin with 12–14 large obtuse teeth, both sides covered (like stem) with fine appressed hairs, the lower side with longer, spreading hairs and densely punctate-glandular; lower petioles $2/5$ – $2/3$ as long as blade; upper cauline and lower floral leaves with petiole 1.5–2 mm long; lower floral and cauline leaves longer than semiverticels; upper floral leaves small, lanceolate-linear, colored, bracteform; inflorescence 6–25 cm long, lax, oblong, consisting of 6–9 verticillasters; upper verticillasters 4–10-flowered, subsessile, approximate but not confluent, the lower 12–16-flowered, dense, 2.5–7 cm apart; peduncles 5–15 mm long; leaves subtending semiverticels and bracts blue, narrowly linear or linear-subulate, the first 3–5 mm, the second 1–2.5 mm long; pedicels 0.5–1 mm long; calyx 6–7.5 mm long, straight, with slightly oblique throat, blue, densely covered with yellowish hairs (these nearly straight, spreading, longer in lower part, short, antrorse in upper part) and rather densely beset with round yellow glands; teeth with broad base, triangular, gradually or abruptly tapering to a point, the margin long-ciliate; corolla 14–15 mm long, pubescent outside; tube curved, exserted to 1–1.5 mm, abruptly expanding into neck, 3–3.5 mm long; upper lip 3–3.5 mm long, cleft to middle or slightly less into obovate or suborbicular lobes 2–2.5 mm wide; middle lobe of lower lip 4 mm long, 7 mm wide, with large teeth, the lateral lobes 1.2–1.3 mm long, 3–3.5 mm wide; upper stamens as long as upper lip; style slightly exserted from corolla; nutlets brown, ellipsoid, 2.5 mm long, 1.3–1.4 mm wide, mostly truncate and toothed at apex by acutish tubercles, covered on both sides with small obtuse tubercles, the dorsal side with 3 rather prominent ribs. Fl. July–August; fr. from first half of August.

Subalpine meadow coenoses on stony and pebbly slopes. — Caucasus: S. Transc. (NW Armenia, Mount Aragats and Mount Alibek). Endemic. Described from Mount Aragats (Alagez), Karamlykh ravine. Type in Leningrad.

44. *N. buhsei* Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 299. — *N. racemosa* Benth. in DC. Prodr. XII (1848) 385, p. p. (quoad pl. pers.) non 1834; Boiss. et Buhse in Nouv. Mém. Soc. Nat. Mosc. XII, 175; Bge. in Mém. Acad. Sc. Pétersb. VII, sér. XXI, 1, 54 (excl. pl. Szovits.); Boiss. Fl. or. IV, 660, p. p. (quoad pl. pers.) non 368 Lam. — ? *N. racemosa* var. *ghilanica* Benth. in DC. Prodr. XII (1848) 385. — *N. reichenbachiana* Grossh. in Dokl. AN Azerb. SSR, V (1949) 70; idem, Opred. rast. Kavk. 332, p. p. non Fisch. et Mey.

Perennial; root woody, more or less twisted, branching, passing into short horizontal rhizome; stems few, erect, 30–70 cm long, 1.5–2.5 mm across, covered with short soft 3–4 (5)-jointed spreading hairs; internodes 6–7 to inflorescence (13–16 including inflorescence),

the lower short, the upper 5-7 cm long; lower leaves obliquely upright, the upper parallel to stem, not rugose, with prominent larger veins, yellowish-green, broadly ovate, with cordate base (only upper leaves oblong-ovate, with nearly truncate base), each margin with 9-19 large obtuse or acute teeth, the upper side with very slender short spreading 3-5 (7)-jointed hairs, the lower side with longer (especially on veins) subappressed hairs and densely covered with punctate glands; cauline leaves 1.9-3 cm long, 1.3-2.3 cm wide; petioles short, the lower 1/6-1/4 as long as blade, the others shorter; upper leaves sessile; bracts shorter than semiverticels, the 2 or 3 lower pairs resembling cauline leaves but smaller, the others narrowly lanceolate, small, colored, bracteiform; inflorescence 10-25 cm long, lax, consisting of 6-9 verticillasters; upper semiverticels 2-4-flowered, subsessile, in subremote pairs, the others 6-12-flowered, dense, peduncles 10-15 mm long, very distant; leaves subtending semiverticels and bracts linear-subulate or rarely lanceolate-linear, the first 4-5 mm long, the second 1.5-2.3 mm long, blue, covered with long soft hairs; pedicels 0.6-1 mm long; calyx 6.5-7.5 mm long, nearly straight, with slightly oblique throat, blue, 15-nerved, densely tomentose-villous with implexed white or blue hairs; teeth subequal, triangular, with broad base, in upper part abruptly (rarely gradually) acuminate, 2/7-1/3 as long as tube; corolla 13-14 mm long, pubescent outside, with slender tube exerted to 1.5 cm [sic], abruptly expanding into neck 3-4 mm long; upper lip cleft slightly beyond middle into broad obtuse lobes; middle lobe of lower lip 4 mm long, 6-7 mm wide, with large triangular marginal teeth, the lateral lobes nearly semiorbicular-triangular, 1.2-1.3 mm long, 2.1-2.6 mm wide; upper stamens with filaments slightly longer than upper lip of corolla, lower stamens and style slightly shorter; nutlets brownish-black, ellipsoid, 2 mm long, 1-1.2 mm wide, unevenly obtusely tuberculate, the 3 longitudinal dorsal ribs not very prominent, the ventral side with a sharp edge. Fl. June; fr. from first half of July.

369 Exposed gravelly and stony slopes in upper part of central mountain belt and in subalpine belt. — Caucasus: Tal. **Gen. distr.:** Iran. (northern part adjacent to Tal., Iranian Azerbaidzhan, Gilyan). Described from vicinity of Karabak-Yurdinskii in Tal. Type in Leningrad.

Cycle 2. *Mussiniana* Pojark. — Calyx markedly curved, with oblique throat; lower teeth smaller than the upper; corolla (10) 12-20 (22) mm long, the narrow part of tube slightly exerted; nutlets pitted and obtusely tuberculate. Inflorescence a more or less one-sided raceme consisting of remote or distally more or less crowded few-flowered verticillasters; stems many; leaves subhorizontally patent.

This series contains species growing in Transcaucasia and Southwest Asia. In addition to species described below, it should also include *N. crassifolia* Boiss. et Buhse (Elburz Range), *N. longiflora* Vent. (N. Iran), *N. mariifolia* Boiss. et Huet (Erzerum) and *N. daflersiana* Schfth. (mountains of Yemen in the Arabian Peninsula).

45. *N. mussinii* Spreng. in Henckel, Adumbr. pl. (1806) 15; M. B. Fl. taur.-cauc. II, 39, III, 390; Benth. in DC. Prodr. XII, 385, p. p. quoad pl. iber.; Ldb. Fl. Ross. III, 376, p. p.; Boiss. Fl. or. IV, 660, p. p.; N. Pop. in Tr. Bot. sada Yur'evsk. univ. XIV (1914) 234, p. p.; Grossg. Fl. Kavk. III, 295 p. p.; idem, Opred. rast. Kavk. 332, p. p. — *N. longifolia* Sims in Curtis Bot. Mag. XXIII, I (1806) 23, non Vent. — *N. salviaefolia* Pers. **Syn.**

II (1807) 125. — *N. willdenoviana* Adams in Hoffm. Hort. mosc. (1808) 25 (excl. synonym. Vent.). — *N. grandiflora* γ. *mussinii* N. Kuzn. in Uch. zap. Yur'evsk. univ. 2 (1899) 48. — **Ic.:** Rchb. Ic. bot. VI, tab. 587, fig. 806; Sims, l. c. tab. 923 (sub. *N. longifolia*). — **Exs.:** Pl. or. exs. No. 270.

Perennial; root woody, slender, more or less knotty, coarsely fibrous, passing into woody short rhizome, sometimes branching; stems many, 13–40 cm long, slender, 0.7–1.5 mm across, ascending, with woody sometimes perennial bases, with 12–16 internodes (including inflorescence), at first unbranched or with few short mostly sterile axillary branches, later often developing rather numerous branches, densely grayish-hairy, the hairs very short, fine, crisp, appressed (sometimes longer and spreading in lower part of stem); leaves thin, the upper side with network of nerves and thus often rugose, green or grayish-green, densely covered with very short appressed hairs, the lower side with some prominent veins, usually grayish tomentose-velutinous or velutinous all over with very fine short im-
 370 plexed hairs and with numerous punctate yellow glands; cauline leaves (7) 10–24 mm long, (6) 7–10 mm wide, oblong-ovate, rarely ovate, obtuse, more or less deeply cordate, crenate or dentate-crenate from base (with 11–17 teeth on each margin); lower petioles ca. 2/3 as long as blade, the upper 1/4–1/2 as long; leaves of axillary branches narrower, usually lanceolate, often acute; lower floral leaves resembling the cauline but subsessile or sessile, the upper bractiform; inflorescence of 4–8 (10) verticillasters forming a more or less one-sided raceme (2) 3–10 (14) cm long; upper semiverticels subsessile, crowded at summit, often confluent, the lower on peduncles 0.5–2 cm long, in remote pairs; bracts narrowly lanceolate, usually conduplicate, 1.5–2.5 mm long; leaves subtending semiverticels slightly longer; calyx (5) 6–7.5 mm long, usually bluish, softly tomentose-arachnoid with implexed long patent jointed blue and white hairs; teeth triangular to lanceolate, (1/3) 1/4–2/7 as long as tube, the 2 lower slightly narrower and often slightly shorter than the upper; corolla (9) 10–13 mm long, densely short-hairy outside, lilac-blue, with darker violet-blue spots at throat; tube exerted to 1–1.5 mm, abruptly expanding into neck, ca. 3 mm long; upper lip cleft to middle into obtuse lobes; middle lobe of lower lip 3–4 mm long, 4.5–6 mm wide, strongly concave, coarsely crenate, the lateral lobes obliquely semiorbicular-triangular, 2–2.5 mm wide, 1–1.5 mm long; style and upper stamens as long as upper lip of corolla; nutlets blackish-brown, broadly ellipsoid, 1.75–2 mm long, ca. 1 mm wide, densely covered with small obtuse tubercles. Fl. first half of April to July; fr. second half of June to September.

Dry gravelly and stony slopes, from lower mountain belt to subalpine. — Caucasus: E. Transc. (Tushetia, near Tbilisi, Trialet Range). **Gen. distr.:** Arm.-Kurd. (Kars). Described from live cultivated plants, apparently originating from near Tbilisi. Type unknown.

Note. *N. mussinii* belongs to a very polymorphous cycle and is clearly an aggregate species even after separation of *N. transcaucasica* Grossh. Determination of the geographical races presents considerable difficulties and cannot be achieved without careful observations in nature. A serious obstacle in the way of systematic treatment of this cycle is the great plasticity of its forms that is revealed as conditions of habitat change. Kuznetsov (1899) reported that, when grown under northern conditions, *N. mussinii* changes radically in habit in the course of one vegetative period: high, strongly branching stems are produced, indument is lost, leaves become large and broader. This is also observed in
 371 nature, although not in such drastic form: individuals growing on exposed dry slopes

differ markedly from those growing in the shade or near a source of water, and stems produced at the onset of summer differ from those developing and flowering in July–September. All the same, it would hardly be justified at present to accept *N. mussinii* in the customary wide scope. Some races may be segregated although their differentiation in the herbarium presents difficulties. It is relatively easier to delimit *N. mussinii* Spreng. s. str. (as conceived within the above-outlined geographical limits). A reliable character for recognizing *N. mussinii* Spreng. s. str. is its indument which is made up of hairs that are much finer and more implexed than in other forms of the cycle (the difference becomes very clear when the lower side of the leaves is viewed under high magnification). *N. mussinii* s. str. is distinguishable from the outwardly most similar *W. Armenian* race *N. reichenbachiana* F. et M. also by the usually smaller flowers, more compact inflorescences, more floriferous cymes and the corolla (judging by Reichenbach's drawing), which is apparently not quite the same color.

46. *N. reichenbachiana* Fisch. et Mey. in Ind. sem. hort. Petrop. VIII (1841) 68. — ? *N. racemosa* Lam. Encycl. méth. Bot. I (1785) 711, non Benth. (1848) nec Boiss. (1879). — *N. racemosa* β . *reichenbachiana* Benth. in DC Prodr. XII (1848) 385; Ldb. Fl. Ross. III, 376.

Perennial; root woody, coarsely fibrous, more or less twisted; stems many, ascending, 30–65 cm long, slender, grayish with short fine reclinate crisp hairs, with 13–20 (22) internodes, at onset of flowering simple or with few axillary branches; stems vegetating at end of summer, usually strongly branching; branches slender, leafy, all or the upper sterile; leaves more or less rugose above by impressed network of veins, pale green, rather densely covered with short fine crisp appressed hairs, the lower surface grayish or whitish, with longer hairs (sparser and longer still on the veins) and often with small capitate glands; cauline leaves ovate-lanceolate or lanceolate, rarely oblong-ovate, with shallowly cordate or subtruncate base, obtuse or rarely acuminate, finely crenate from base (with 12–16 crenae on each margin), (8) 12–23 mm long, 7–12 mm wide; lower petioles 1/3–1/2 as long as blade, the upper shorter, verticillasters 5–8 (10) pairs, forming a lax, more or less one-sided raceme; semiverticels of 2–4, the lower of 6 flowers, the upper subsessile, the pairs loosely approximate, not confluent, the lower 1.5–3 cm apart, on peduncles 5–16 mm long; lower floral leaves resembling upper cauline leaves but sessile, the upper small, 2–5 mm long, lanceolate, entire; leaves subtending cymes 1.5–2 mm long; bracts 1–1.5 mm long, narrowly lanceolate or linear-subulate, arcuately curved, violet, densely pubescent; pedicels 1–2 mm long; calyx 6.5–9 mm long, violet, arachnoid- or downy-tomentose, with violet and white implexed hairs; teeth triangular or narrowly triangular, 1/5–2/7 as long as tube; corolla 11–14 mm long, faintly violet-blue, densely white-hairy outside; tube slender, exserted to 1–1.5 mm; upper lip cleft to middle into obtuse lobes; middle lobe of lower lip 3 mm long, 5 mm wide, undulate-crenate, the lateral lobes semiorbicular-triangular, 1–1.5 mm long, 2–2.5 mm wide; nutlets dark brown, obovoid, 3-angled, obtusely tuberculate-foveolate, with 3 more or less prominent longitudinal ribs on dorsal side. Fl. May–August (September); fr. from June. (Plate XXII, Figure 3.)

Rocky and stony slopes in middle mountain and subalpine belts. — Caucasus: S. Transc., W. Armenia, and, apparently, Nakhichevan ASSR. **Gen. distr.:** Arm.-Kurd. Described from Mount Ararat. Type in Leningrad.

Notes. 1) Bentham considered *N. reichenbachiana* Fisch. et Mey. as a variety of *N. racemosa* Lam. and Boissier regarded them as identical. Neither of these authors saw either the type of *N. racemosa* Lam. (described from material by Tournefort) or that of *N. reichenbachiana* Fisch. et Mey. and obviously drew their conclusions from the diagnoses of these species which are, in fact, very similar. It cannot be ruled out that these two species are not actually identical since Tournefort's route passed through that part of Armenia which includes Mount Ararat, the area of *N. reichenbachiana*. It should also be noted that the plant described by Reichenbach (Rchb. Ic. bot. tab. DLXXXV, fig. 804) under the name *N. racemosa* Lam. is very similar to *N. reichenbachiana*. Proceeding from the impossibility of proving the identity of *N. racemosa* Lam. with *N. reichenbachiana* Fisch. et Mey., we have chosen the second epithet for the Armenian race as quite reliable, all the more so since the name *N. racemosa* was applied in the past to a wide array of completely unrelated species. Even Bentham and Boissier identified *N. racemosa* Lam., not just nominally but also in practice, with species remote from *N. reichenbachiana*, listing under this name mainly specimens from N. Iran (Buhse, Bunge, Oshe, Kotschy) that belong to species now described under the name *N. elbursensis* Rech. fil. and *N. buhsei* Pojark. Grossgeim (1944) made it clear that he had earlier reported *N. transcaucasica* Grossh. from the Caucasus under the name *N. racemosa*.

373 2) In his last works, Grossgeim (1949), being unacquainted with the type of *N. reichenbachiana*, erroneously included under this name the Caucasian species which have here been separated in the series *Strictifoliae*.

3) In habit, *N. reichenbachiana* resembles most closely *N. mussinii* Spreng., from which it differs in the characters indicated in the Note to the latter species. Fully conforming with typical specimens of *N. reichenbachiana* are plants from the vicinity of Erevan (spurs of Akhmagan Range), where I was able to observe and collect this species, and also specimens from Mount Aragats. From the material available it is difficult to ascertain the eastern limit of this species (Nakhichevan ASSR) and differentiate it from the very polymorphous and, apparently, aggregate species *N. transcaucasica* Grossh.

47. *N. hajastana* Grossh. in Izv. Azerb. fil. AN SSSR, 10 (1944) 88, p. p. quoad typ.; idem, Opređ. rast. Kavk. 332, p. p.

Perennial, very close to *N. reichenbachiana* Fisch. et Mey. and distinguished from it by the erect, longer (30-90 cm) and thicker (2.5-3 mm) stems, mostly branching, grayish with very fine appressed pubescence; internodes to 5-7.5 cm long; branches slender, fertile; subsidiary stems arising from rhizome in varying number, densely leafy, short, also erect, partly fertile, but mostly sterile, with smaller and narrower leaves; leaves on main stems triangular-ovate, rarely oblong-ovate, the middle largest, 1.5-3.3 cm long, 0.8-2.3 cm wide, obtuse, with cordate base; inflorescence to 30 cm long, of 8-11 verticillasters, the upper rather loosely approximate or 1-2 cm apart, the lower 4 or 5 3-6 cm apart; semiverticels 2-6-flowered, the upper subsessile, the others on peduncles 1-2.5 cm long; lower floral leaves large, foliaceous, as long as peduncles, the upper bracteiform; bracts, calyx and corolla resembling those of *N. reichenbachiana* in size, shape, color and vesture; nutlets also completely alike. Fl. April-June; fr. from end of April.

Stony and silty-stony slopes, ca. 1000 m. — Caucasus: S. Transc. Described from the Erevan suburb of Nork, the only location from which it is known. Type (lectotype) in Leningrad.

(375)



PLATE XXII. 1 - *N. cyanea* Stev., flower; 2 - *N. strictifolia* Pojark., general aspect, flower, nutlet in dorsal view; 3 - *N. reichenbachiana* Fisch. et Mey., upper part of plant, flower, nutlet in ventral view.

Notes. 1) A critical species, in need of further study, especially in nature. As already reported, it is very close to *N. reichenbachiana* Fisch. et Mey. from which it differs, practically speaking, only in the high, erect stems, larger and broader leaves, and sparser and longer inflorescences. I was able to observe both species in flower (*N. hajastana* in its classical location and *N. reichenbachiana* near the Gekhart monastery at the spurs of Akhmagan Range) and must note that the above indicated distinctions between them still hold good. Consequently, I have decided to retain the separate identity of the two species.

2) *N. hajastana* Grossh. has been described from herbarium specimens collected in the vicinity of Nork (near Erevan) and Bicheny (Nakhichevan ASSR). Careful comparison of authentic specimens showed differences between them and precluded their inclusion in one species. According to the author's diagnosis, it can be concluded that the species was described from a plant collected at Nork, and I have therefore accepted it as the type. The plant from Bicheny, which differs from *N. hajastana* in having a straight calyx with slightly oblique throat, coarser indument, and a short inflorescence consisting of a few pairs of short-peduncled semiverticels, should be included among crosses *N. strictifolia* X *transcaucasica* which are rather common in this part of S. Transcaucasia.

48. *N. transcaucasica* Grossh. in Izv. Azerb. fil. AN SSSR, 10 (1944) 38; idem, Oprod. rast. Kavk. 332. — *N. longiflora* C. A. M. Verzeichn. Pfl. Cauc. kasp. Meer. (1831) 92, non Vent. — *N. mussini* auct.: Benth. in DC Prodr. XII (1848) 385, p. p. (excl. pl. iber.); Ldb. Fl. Ross. III, 376, p. p.; Boiss. Fl. or. III, 660, p. p.; Grossg. Fl. Kavk. 292, p. p. non Spreng. — *N. racemosa* Grossh. Fl. Kavk. III (1932) 296, non Lam.

Perennial; root and rhizome as in *N. reichenbachiana*; stems many, ascending, 10–40 (50) cm long, 1–2 mm across, with internodes 3–6 (7) cm long, simple or branching mainly in lower part, densely patent-hairy, the hairs fairly long, especially in lower part, crisp, often shorter and subappressed in upper part; branches usually short, sterile, rarely fertile; leaves bright green above with copious short appressed hairs and impressed network of veins, grayish beneath, more densely covered with longer hairs; cauline leaves much shorter than internodes, cordate-ovate, rarely oblong-ovate to lanceolate, 10–32 mm long, 7–20 (22) mm wide (smaller and narrower on axillary branches), obtuse, evenly and often rather deeply crenate with (9) 11–16 crenae on each margin; lower petioles about the length of blade, the upper shorter, 1/6–2/5 as long as blade; lower floral leaves resembling the cauline, usually as long as semiverticels without corollas, the upper bracteiform, narrow, entire; inflorescence 5–10 cm long, rarely slightly longer, consisting of small number of dense verticillasters, the upper 3 or 4 (often all) crowded at summit, 1 to 3 remote; semiverticels 4–8-flowered, the upper sessile or subsessile, the lower on peduncles 3–10 (15) mm long; leaves subtending semiverticels narrowly lanceolate, 3–5 mm long; bracts 1.5–2 mm long, linear-oblong; pedicels 0.5–2 mm long; calyx 8–11.5 mm long, arachnoid-tomentose or tomentose-pilose outside (like bracts), the long soft hairs blue and white, of 4–9 cells; throat strongly oblique; teeth lanceolate, acuminate, the upper (1/4) 2/7–1/3 as long as tube; corolla 16–20 (22) mm long, violet-blue, white-pubescent outside, the narrow part of tube exerted 2–3 (3.5) mm, expanding into neck 3–4 mm long; upper lip cleft to 2/3–3/5 into ovate obtuse lobes; lower lip twice as long as the upper, the large middle cordate lobe to 4–5 mm long, 8–9 mm wide, the lateral lobes obliquely semiorbicular, (1) 1.3–1.6 mm

long, 2.5–3.5 mm wide; upper stamens and style as long as upper lip; nutlets dark brown or blackish-brown, obtusely foveolate-tuberculate, broadly ellipsoid or nearly obovoid, 1.75–2 mm long, 1.25–1.3 mm wide, with 3 prominent longitudinal ribs on the back. Fl. May to first half of August; fr. from end of June.

Dry stony and pebbly slopes, pebbles in central and subalpine mountain belts. — Caucasus: E. and S. Transc., Dag. (extreme south), Tal. **Gen. distr.:** western parts of Iran. Described from vicinity of Shush. Type in Baku.

Notes. 1) In describing *N. transcaucasica*, Grossgeim contrasted it with *N. mussinii*, indicating its higher growth, larger leaves and calyx, and distribution in S. Transcaucasia and Talysh. In accordance with this characterization of his species, Grossgeim consistently regarded the lower and more narrow-leaved forms growing in the above-named regions as *N. mussinii*, a position with which it is impossible to agree. *N. mussinii* can be reliably distinguished from *N. transcaucasica* only by the very fine indument of the leaves and stems although, on the whole, it tends to be a lower plant with narrow leaves, while its flowers do not attain the large size often observed in *N. transcaucasica*.

2) It is far more difficult to distinguish *N. transcaucasica* from *N. reichenbachiana* which, like *N. mussinii*, is characterized by narrow leaves and small flowers. Even though one may discern certain characteristic features of *N. transcaucasica*, such as a slight tendency toward branching of the stems, terminal part of its inflorescence usually compact, nearly spicate, peduncles always short, and corolla-tube more exerted from the calyx, it is often impossible to differentiate with certainty between herbarium specimens 378 of *N. transcaucasica* and *N. reichenbachiana*, especially in the western part of the range, where these species are linked by intermediate forms, possibly hybrids. However, we have decided to acknowledge *N. transcaucasica* Grossh. on the following grounds. In the more eastern regions (Karabakh, Gandzha, Talysh) there is a definite predominance of specimens with typical characters of *N. transcaucasica*, while such forms are unknown within the range of *N. reichenbachiana*. The specific status of *N. transcaucasica*, as well as its extent and contiguity, still have to be determined. Only by careful observation in nature will it be possible to sort out the diversity of forms revealed by herbarium material from Southern and Southeastern Transcaucasia.

Among this diversity, plants from Talysh attract attention by more pronounced characters: always densely hairy leaves, corolla-tube exceeding calyx by 3–3.5 mm, a feature which allies them to *N. longiflora* Vent. and probably accounts for their erroneous inclusion in that species by C. A. Meyer.

49. ***N. noraschenica*** Grossh. in Dokl. AN Azerb. SSR, V (1949) 71; idem, Oprod. rast. Kavk. 332.

Perennial; root slender, woody, branching, passing into short rhizome, stems numerous, 25–45 cm long, 1.2–2 mm across, ascending, more or less arched, simple or with 1–2 pairs of short branches, green, with long and soft spreading simple 4–6-jointed hairs, tomentose under inflorescence; internodes 5–6 (not counting inflorescence), 3–6.5 cm long; lowermost leaves small, 0.5 cm long, 0.35 cm wide, brown, entire or undulate-dentate, the long-hairy petioles about the length of blade; other cauline leaves grayish-green, slightly paler beneath, thin, not rugose, the upper side densely covered with short appressed hairs, the lower side with much longer (especially along nerves) thinner softer hairs and punctate

yellow glands with a small admixture of sessile white capitate glands; upper leaves oblong-ovate, others ovate, all with deeply cordate base, rounded at apex, with a total of (12) 14-16 large obtuse or acute teeth; middle leaves largest, 3-4 cm long, 2.3-3 cm wide; lower petioles $2/5-1/2$ as long as blade, those of middle leaves short; upper cauline leaves sessile; lower floral leaves resembling the upper cauline, usually exceeding semiverticels; upper floral leaves lanceolate-linear, bracteiform; inflorescence 4-9 cm long, consisting of 379 few sessile verticillasters crowded at summit and 1 or 2 pairs of remote semiverticels with short straight peduncles 7-10 mm long; semiverticels dense, 4-8-flowered; leaves subtending semiverticels and bracts linear-lanceolate or linear, respectively 3-4 mm and 2-3 mm long, all densely covered with long hairs; pedicels ca. 1 mm long; flowers bisexual or gynomonoeious, the latter slightly smaller; calyx 7-9.5 mm long, tubular in flower, ovoid-urceolate in fruit, curved, with oblique throat; teeth subequal, triangular or triangular-lanceolate, $1/3-2/5$ as long as tube, green or in upper part violet-tinged, very densely covered with long straight spreading 5-10-jointed soft white hairs; corolla, according to Grossgeim, "sky-blue" (violet-bluish when dry), grayish outside with dense pubescence, 11-13 mm long in female flowers and to 17 mm in bisexual, the slender curved tube barely exerted from calyx; upper lip cleft to middle into obtuse broad lobes; lower lip half as long as the upper, the middle lobe in bisexual flowers 2.5-3 mm long, 3.8-5.5 mm wide (in female flowers relatively smaller), the lateral lobes broadly triangular, 1.3 mm long, 2-2.75 mm wide; stamens in bisexual flowers with elliptic cells convergent at an obtuse angle, as long as upper lip of corolla, in female flowers reduced to staminodes, included in dilated part of tube, with small rounded submembranous rudiments of anthers and with slender filaments; nutlets dark brown, densely covered with unequal obtuse tubercles, broadly ellipsoid or obovoid, 2-2.5 mm long, 1.3-1.5 mm wide. Fl. April-May; fr. from first half of May.

Rocky slopes in lower mountain belt. — Caucasus: S. Transc. Described from Nakhi-chevan ASSR, Tandra Mountain near Arpachai, vicinity of Norashen (so far the only location). Type in Leningrad.

Note. It is impossible to agree with Grossgeim, who relates *N. noraschenica* to *N. persica* Boiss. Similarity between these two species is restricted to the shape and dentation of the leaves and the long, spreading hairs. Differences between them are far greater and evidence of lack of close affinity. Among the features which set *N. persica* apart are: straight campanulate calyx with regular throat; corolla reddish, with white stripes; nutlets ovoid, with strongly convex, tapering papilliform processes. *N. persica* is also characterized by abundant indument of stipitate, viscous, glandular hairs. In its aggregate of characters, *N. noraschenica* undoubtedly approaches species of *N. mussinii* Spreng. 380 affiliation, especially *N. transcaucasica* Grossh. from which it differs in the long, spreading indument, paler corolla and, to a lesser degree, the shape of the leaves, since some large-leaved specimens of *N. transcaucasica* have leaves very similar in shape and dentation to those of *N. noraschenica*.

Section 6. **Micranthae** (Boiss.) Pojark. comb. nov. (emend.); Boiss. Fl. or. IV, 639 (pro subsect.); Briq. in Pflanzenfam. IV, 3a, 238 (pro subsect.). — Calyx tubular, in fruit oblong-ovoid or campanulate, curved or straight, with oblique or 2-lipped throat; corolla

mostly small, 3.8–7 (8.5) mm long or medium-sized, 11–15 mm long; middle lobe of lower lip subhorizontal, spreading or reclinate, concave, without basal swelling; surface of nutlets coarsely tuberculate to finely granular; flowers in cymes or semiverticels, these all in remote pairs or the upper crowded in a terminal head, their subtending leaves small, bracteiform. Annual, sometimes biennial plants.

These species are predominantly Iranian, some of them penetrating into Transcaucasia and Central Asia. They are distributed in the foothill and low mountain belts.

Note. The scope of the section *Micranthae* has been extended here as compared with that generally accepted, by inclusion of a number of species formerly incorrectly referred to the section *Micronepeta*. Included in the transfer are *N. ispanhanica* Boiss. and closely related species which compose the natural phyletic series *Ispanhanicae* Pojark., whose characteristics and composition are given below; also a group of species forming the series *Wettsteinianae* Pojark. (not represented in the USSR), which is allied to the series *Micranthae* and comprises the Iranian species *N. wettsteinii* H. Braun, *N. petraea* Benth., *N. hymenodonta* Boiss. and *N. kurdica* Hausskn. et Bornm. as well as one Afghan species, *N. afghanica* Pojark.

Series 1. *Amoenae* Pojark. — Flowers medium-sized; calyx 6.5–9 mm long, corolla 11–15 mm long; calyx curved, in flower narrowly tubular, in fruit oblong-ovoid with 2-lipped throat; upper teeth ovate, $1/4$ – $1/3$ as long as tube; lower teeth triangular-lanceolate, incisions between them not exceeding $1/3$ the length of calyx; narrow part of corolla-tube distinctly exerted from calyx; nutlets coarsely tuberculate; flowers in cymes; lower cymes remote, peduncled, the upper sessile, more or less crowded, sometimes forming a capitate-spicate terminal inflorescence; leaves subtending cymes and bracts linear-oblong, linear, flat, not conduplicate.

This series contains the two species described below.

50. *N. amoena* Stapf in Denkschr. Akad. Wissensch. Wien, I (1885) 45; Grossg. Fl. Kavk. III, 291, p. p.; idem, Opred. rast. Kavk. 330, p. p.

381 Annual or biennial; root slender, tough, woody, vertical or descending; stems simple or with few pairs of slender fertile axillary branches, sometimes branching at base with 2–8 branches nearly as long as stem, erect or often ascending, sometimes with woody or radicate base, 7–60 cm high, 0.6–4 mm across, with sparse or dense (especially in lower part) lanate spreading white jointed slightly crisp hairs and more or less densely covered with small white sessile glands; leaves thin, bright green above, unevenly covered between veins with white short appressed hairs, somewhat paler beneath, with similar though more evenly distributed indument, the veins more densely covered with longer lanate hairs; cauline leaves 0.8–3.5 cm long, 0.5–3.5 mm wide, broadly ovate, all cordate or the upper with truncate base, obtuse or rounded at apex, each margin with 7–12 large obtuse or rarely acute teeth; lower petioles as long to $1\frac{1}{2}$ –2 times as long as blade, the others short; upper leaves often subsessile; floral leaves often resembling the upper cauline in size and shape, the upper narrower, sparingly toothed to entire, the uppermost oblong, partly suffused with violet, bracteiform; cymes 3–8-flowered, forming elongate racemes or panicles, the upper 2 or 3 pairs of cymes dense, with short axis, resembling semiverticels on peduncles

3–8 mm long, loosely approximate to subremote; other cymes on peduncles 1.3–6 cm (the lowermost to 9 cm) long, 2.8 cm apart, sparser, usually loosely dichotomous, with axes of first order to 1.5–2 cm long; bracts 2–5 mm long, linear-spatulate or oblong-linear; pedicels 0.8–2 mm long, in cyme bifurcations 2–6 mm long; calyx 6.5–9 mm long, prominently 15-nerved, violet, rather densely covered with spreading simple 4–6-jointed coarse hairs and sparse capitate stipitate glands intermixed with round sessile yellow resinous glands; upper teeth $1/4-1/3$ as long as tube, ovate, short-pointed or more or less acuminate (especially the lateral), the middle tooth distinctly larger than lateral, the two lower teeth shorter, narrow, lanceolate, acuminate; corolla pale, bluish-lilac, with darker spots on lower lip, pubescent outside, 11–15 mm long, tube slender, exerted to 1.5–2.5 mm, abruptly expanding into neck 2.5–3 mm long, 3–4 mm wide; upper lip ca. 3 mm long, erect, nearly flat, cleft to middle or slightly less into obovate lobes; lower lip twice as long as the upper, 382 its middle lobe ca. 3.5 cm long, 5.5 mm wide, strongly concave, with crenate-incised margin, the lateral lobes semiorbicular-triangular, 1–1.3 mm long, 2 mm wide; upper stamens as long as upper lip of corolla; nutlets 1.5–1.75 mm long, 1–1.2 mm wide, broadly ellipsoid, 3-angled, strongly convex on ventral side, dark brown, coarsely tuberculate. Fl. April–May; fr. from beginning of May. (Plate XXIII, Figure 3.)

Foothills and lower mountain belt, steppes, exposed stony pebbly and sandy slopes, taluses. — Caucasus: E. Transc. (vicinity of Khudofersinsk in Dzhebrail'skii region of Azerbaidzhan). **Gen. distr.:** N. Iran. Described from near Rudbar in Gilyan (N. Iran). Type in Vienna.

51. *N. troitzkii* Sosn. in Fl. Gruz. VII (1952) 303 (in Georgian). — *N. amoena* auct. fl. Cauc.: Grossg. Fl. Kavk. III, 291; idem, Opred. rast. Kavk. 330, p. p. non Stapf. — *N. amoena* auct. fl. Cauc. p. p. non Stapf. — *N. micrantha* auct. fl. Cauc. p. p. non Bge.

Perennial, very closely related to the preceding from which it is distinguished by the following features: stems not lanate in lower part; leaves usually truncate, rarely slightly notched at base; inflorescence much more compact, consisting of (2) 4–5 (7) pairs of cymes; upper cymes with up to 8 flowers, very dense, outwardly scarcely differing from semiverticels, sessile, the 2 or 3 upper pairs closely crowded at summit of stem in a spicate, cylindrical or ovoid inflorescence (sometimes all cymes clustered in a head), lower cymes on peduncles 1–4 cm long, less remote than in *N. amoena*, usually all compact, rarely the lowermost distinctly dichotomous, but axes of first order not more than 1 cm long; bracts 2–3 mm long, narrowly linear. Otherwise like *N. amoena* Stapf. Fl. April–May; fr. from end of May.

Stony and gravelly slopes in foothills and lower mountain belt. — Caucasus: E. Transc.: Georgia (Karayazy) and Azerbaidzhan (Kazakh region, Shirvanskaya steppe, Shemakhinskii region, Apsheron). Endemic. Described from near Karayazy in Georgia. Type in Tbilisi.

Series 2. *Micranthae* Pojark. — Flowers small, calyx 3.5–7 (8.2) mm long, curved, 2-lipped, narrowly tubular in flower, oblong-ovoid in fruit; corolla 3.8–8.5 (9.5) mm long; upper teeth $1/4-1/2$ as long as tube; lower teeth narrowly lanceolate, incisions between

them 1/3–1/2 length of calyx; corolla included in calyx to the limb (sometimes even up to the middle of upper lip) or only to base of dilated part of tube (neck); nutlets pitted, with flat tubercles; flowers in remote peduncled cymes; leaves subtending cymes and bracts linear-subulate or setiform, usually conduplicate.

383 In addition to species distributed in the USSR, the Iranian species *N. brachyodonta* Pojark. belongs to this series.

52. *N. micrantha* Bge. in Ldb. Fl. Alt. II (1830) 401; id. Fl. Ross. III, 371; Benth. Lab. gen. et sp. 476; in DC. Prodr. XII, 382; Kar. et Kir, Enum. pl. song. 638; O and B. Fedch. Perech. rast. Turk. V, 146 (excl. syn. Boiss.); Kryl. Fl. Zap. Sib. IX, 2312. — Ic.: Ldb. Ic. pl. fl. Ross. V, tab. 412.

Annual, (2.5) 5–30 (35) cm high, with slender vertical root; stems erect, simple or branching, with inflorescences in the axils of most leaves, more or less densely covered with very short reclinate slightly crisp hairs, these simple in lower part, intermixed with glandular, predominantly glandular in upper part, sometimes the stem subglabrous, especially below; leaves 0.8–4 cm long, 0.7–3.5 cm wide, thin, smooth, with thin, distinct (but not prominent) midrib and secondary veins, the upper side pale green, with sparse short hairs (these all simple or intermixed with glandular) and with scattered yellow punctate glands; the lower side glaucescent, with sparse or (especially on veins) profuse glandular spreading hairs interspersed with simple 3–4-celled hairs and numerous punctate yellow glands, often both sides subglabrous, lower and middle leaves ovate or lanceolate or oblong-elliptic, with cuneate or rarely rounded base, obtuse, the margin with 3–5 more or less remote obtuse or acute teeth, these often obscure; fairly often all leaves entire; upper leaves smaller and narrower, lanceolate or oblong to narrowly linear, mostly acute or acuminate, often equaling but mostly somewhat shorter than peduncles; petioles densely glandular-hairy, in lower leaves as long as or slightly longer than blade; cymes few-flowered, forming a lax narrow raceme or panicle; upper cymes (2) 3–5 (8)-flowered, rather compact, with peduncles (1.5) 3–12 mm long, in pairs 6–10 mm apart but not confluent; other cymes 5–8-flowered, sparser, 2–4.5 cm apart, on peduncles 2–3 cm long, often (especially the lower) dichotomously branching, with axes of first order up to 8–13 mm long, in large individuals sometimes repeatedly branching and then containing up to 12 (16) flowers; leaves subtending cymes and bracts narrowly linear or setiform, longer than pedicels, hairy; pedicels 1.5–5 mm long, in bifurcation to 10–13 mm, densely covered (like axes of cymes and peduncles) with glandular hairs; calyx usually 5 (4.5–6.5) mm long, green or violet, pubescent with fine straight spreading hairs and more or less densely covered with sessile or stipitate capitate white glands interspersed with sessile round yellow glands; upper teeth triangular or oblong-triangular, acute or acuminate, 0.9–1.3 mm long, 1/4–1/3 as long as tube, the lower 2 slightly longer (1–1.25 mm) and narrower, narrowly lanceolate, long-acuminate; corolla (5) 5.5–7 mm long, blue or white, only slightly exerted (the uppermost calyx-tooth reaching the middle and sometimes even the apex of upper lip), tube slender, curved; upper lip erect, 1–1.2 mm long, cut to middle into semiorbicular lobes; lower lip nearly twice as long as the upper, the large-toothed middle lobe ca. 1.5 mm long, 2–2.5 mm wide, the lateral lobes broadly triangular, 0.4–0.5 mm long, 1 mm wide; upper stamens as long as upper lip of corolla; nutlets oblong-ovoid, 1.5–1.7 mm long, 0.6 mm wide, with an obtuse edge on ventral side, dark brown, foveolate-tuberculate. Fl. May–June; fr. from second half of May.

Dry steppes and edges of deserts, mainly on sandy soils, sandy hillocks, barkhans, saline sands, saxaul associations, foothills, rarely in lower mountain belt. — West Siberia: Irt. (Ulu-Tau mountains); Centr. Asia: Ar.-Casp. (except for southwestern part), Balkh., Kyz. K. (eastern part), Syr D., T. Sh.: foothills and in spruce belt along Naryn River, introduced?, Pam.-Al. (Zeravshan valley). **Gen. distr.:** Dzu.-Kash. Described from Arkaul mountains in E. Kazakhstan. Type (lectotype) in Leningrad.

53. *N. meyeri* Benth. Lab. gen. et sp. (1834) 478; in Dc. Prodr. XII (1848) 384; Hohe-nack. Enum. pl. talysch, 69; Ldb. Fl. Ross. III, 375. — *N. micrantha* auct.: C. A. M. Verzeichn. Pfl. Cauc. kasp. Meer. (1831) 92; Bge. Lab. pers. 56, p. min. p.; Boiss. Fl. or. IV, 664 (excl. syn. C. Koch); N. Pop. in Tr. Bot. sada Yur'evsk. univ. XIV, 234; Grossg. Fl. Kavk. III, 291, p. p.; idem, Opred. rast. Kavk. 330, p. p. non Bge. (1830). — Exs.: Herb. fl. Cauc. No. 186.

Annual, with slender vertical root; stems (3) 10–45 cm long, densely covered with simple white hairs, sometimes interspersed in upper part with subsessile whitish glands, simple or with 1 or 2 pairs of leafy inflorescence-bearing branches in axils of lower leaves and cymes in all other axils; leaves tougher than in *N. micrantha* Bge., the secondary and often even tertiary veins thicker, impressed above, prominent beneath, the upper side pale green, with sparse, rarely dense, appressed hairs, the lower side glaucescent to whitish, with more copious indument of jointed simple hairs interspersed with very small glandular hairs and numerous punctate glands; lower and middle leaves broad-ovate to oblong-ovate, 0.8–385 3.5 cm long, 0.4–1.5 cm wide, with cordate, truncate or cuneate base, obtuse or acute, always dentate (teeth 4–8 pairs, obtuse or acute), the upper lanceolate to lanceolate-linear, usually with few teeth, rarely entire, often as long as peduncles of cymes or slightly shorter; petioles grayish, with profuse spreading simple hairs, the lower longer than blade, the upper shorter; cymes compact, forming a narrow, usually rather dense raceme; upper cymes 3 (the uppermost)–6–8-flowered, sessile or on peduncles 3–10 mm long, in pairs (2) 3–10 mm apart, the others 6–12 (16)-flowered, with longer peduncles (2–3.5 cm), 2–5 cm apart, dense, with axes of first order to 5 mm, rarely the lower distinctly dichotomous, with axes 10–15 mm long; peduncles, axes and pedicels densely white-pubescent, with crisp hairs sometimes interspersed with very small whitish sessile or short-stipitate glands; pedicels 0.8–2.5 (3) mm long, to 10 (15) mm long in bifurcation of cymes; bracts linear-subulate, long-ciliate, 2–5 mm long; calyx (5.5) 6–8.5 mm long, narrowly tubular in flower, oblong-ovoid in fruit, green with white corolla or more or less violet to dark violet with blue corolla, densely covered with long spreading hairs and with numerous minute capitate whitish glands and sparse punctate yellow glands; upper teeth narrowly lanceolate, acuminate; middle tooth slightly longer than lateral teeth, 1/3–2/5 as long as tube; lower teeth narrower, lanceolate-subulate, long-acuminate; corolla 7–8.5 (9.5) mm long, blue, rarely white or pink, the slender curved tube abruptly expanding into neck 2 mm long and ca. 2.5 mm wide; tube (and partly neck) concealed in calyx, the limb completely exerted (the largest uppermost calyx-tooth reaching the base of upper lip); upper lip 1.5–2.5 mm long, cut nearly to the middle into semiorbicular lobes; lower lip with large-toothed middle lobe 2–4 mm long and 4–4.5 mm wide, the lateral lobes semiorbicular-triangular, 0.6–1 mm long, 1.5–2.3 mm wide; nutlets oblong-ellipsoid, 1.3–1.5 mm long, 0.75–0.85 mm wide, dark brown, with an obtuse edge on ventral side, foveolate, with flat tubercles. Fl. (March?) April to second half of July; fr. from second half of April.

Desert lowlands in Kura and Araks river valleys, also in lower and central mountain belts on exposed southern slopes. — Caucasus: E. Transc. (Kura valley), S. Transc., Tal. **Gen. distr.:** Arm.-Kurd. Described from Zuvant in Tal. Type in London; type duplicate in Leningrad.

386 Note. Bentham first distinguished the Caucasian *Nepeta*, included by C. Meyer in his list of plants of the Caucasus (1831) under the name "*M. micrantha*," from specimens of the true *N. micrantha* Bge. known to him from the western foothills of the Altai, and he described it as a separate species. However, later authorities, including Bunge, did not recognize the specific status of *N. meyeri* Benth. and again combined it with *N. micrantha* Bge. The herbarium material that has since accumulated for both species fully confirms the need to separate *N. meyeri* Benth. It is readily distinguishable from *N. micrantha* Bge. by its larger flowers, the partly or fully exerted neck of the corolla, the more compact cymes with a larger number of flowers, the relatively tough and nearly always toothed leaves with more prominent veins, and glandular hairs on peduncles, inflorescence axes and petioles less developed or often absent.

54. *N. pallida* C. Koch in Linnaea, V (1848) 675. — *N. micrantha* auct.: Boiss. Fl. or. IV (1879) 664, p. p.; Grossg. Fl. Kavk. III, 291, p. p.; idem, Opređ. rast. Kavk. 330, p. p. non Bge. nec C. A. M. — *N. bordzilovskii* Tam. et An. Fed. in Grossg. Opređ. rast. Kavk. (1949) 330, ross.

387 Annual, branching, 3–25 cm high; stems scaberulous with very short simple white hairs sometimes intermixed with sessile or subsessile whitish glands; branches in axils of 2 or 3 lower pairs of leaves, usually nearly as long as stem, fertile; leaves pale, grayish-green, the rather thick veins impressed above, prominent beneath, the lower side rather densely covered with short capitate glandular hairs interspersed on the veins with longer simple jointed hairs and with numerous sessile round yellow glands, the upper side with similar but sparser indument; lower leaves 7–18 mm long, 5–12 mm wide, ovate, with rounded or cuneate or sometimes cordate base, acute or obtuse, the margin with obtuse or acute triangular teeth; middle and upper leaves usually narrower, oblanceolate or oblong-elliptic, acuminate, gradually smaller and more bracteiform toward summit; floral leaves subtending lower cymes usually slightly shorter than peduncles, the middle usually longer and sometimes exceeding the whole axillary inflorescence; cymes dense, compact, 6 (the uppermost)–8–26-flowered, in contracted raceme, the upper sessile or subsessile, in closely approximate pairs, the others 1–2 (3) cm apart, on 3–13 mm long peduncles; axes of first order very short, hence cymes very compact, often resembling semiverticels; pedicels 1.5–3 mm, in bifurcation 3–5 mm long; bracts narrowly linear or subulate, 2–3 mm long; in addition to individuals with bisexual flowers, there was one specimen with female flowers; calyx 3.6–5 (6) mm long, in flower narrowly tubular, in fruit oblong-ovoid; green (in white-flowered form — *N. bordzilovskii* Tam. et An. Fed.) or violet (in typical form with blue flowers), densely covered outside with small sessile and subsessile whitish glands and spreading simple hairs; upper teeth oblong-triangular to lanceolate, acuminate, the middle tooth distinctly larger than lateral teeth, 1/3–1/2 as long as tube, the lower teeth with broad base, sharply tapering to a long point; corolla pubescent outside, very hairy on lips, 3.8–5.2 (6.2) mm long, nearly concealed in calyx (uppermost tooth reaching the middle or nearly the apex of upper lip, others reaching the base of lower lip); tube slender, curved,

abruptly expanding into neck; upper lip shallowly cut into semiorbicular lobes; lower lip wider than long, concave, with large-toothed margin, the lateral lobes triangular, obtuse; upper stamens in bisexual flowers as long as upper lip of corolla; style as long as or shorter than upper stamens; female flowers with 4 staminodes in dilated part of tube, these consisting of very short filament and rounded scarious sterile rudiment of anther; style longer than upper lip of corolla; lobes of stigma large, more than 1 mm long, thick, twisted; nutlets ellipsoid, ca. 1 mm long, 0.8 mm wide, brown, tuberculate-foveolate. Fl. May-July; fr. June.

Steppe and semisteppe plant communities in lower and central mountain belts. — Caucasus: S. Transc. (W. Armenia: vicinity of Echmiadzin, Leninakan). Endemic? Described from a basalt outcrop in former Erevan province. Type was in Berlin.

Notes. 1) Specimens from the vicinity of Echmiadzin and Leninakan differ markedly from *N. meyeri* in having much smaller flowers, almost completely concealed in the calyx, very compact many-flowered cymes, much more contracted inflorescence, an altogether distinctive habit, and profuse glandular hairs on all parts, including those that are often eglandular in *N. meyeri* (petioles, peduncles, axial parts of cymes). From the area of distribution of this unique *Nepeta*, C. Koch described *N. pallida* C. Koch, closely allied to *N. meyeri*. He noted some features of *N. pallida*, e.g. the very dense, many-flowered cymes, which also characterize the above-mentioned specimens from the western part of the Armenian SSR, presented here under the name *N. pallida* Koch.

2) *N. bordzilovskii* Tam. et An. Fed. is a white-flowered form of *N. pallida* C. Koch; other distinctions have not been found. White flowers are fairly often observed also in other species of the series *Micranthae*.

3) Worthy of note is the occurrence of gynodioecism in *N. pallida*, as it has never before been recorded for the section *Micranthae*. The female flowers are smaller than the bisexual, with scarcely exerted corolla; they form denser, subglobose lower whorls.

55. *N. saccharata* Bge. Lab. pers. (1873) 56; Boiss. Fl. or. IV, 664. — *N. meyeri* var. *laxiflora* Kotschy. Pl. Pers. bor. exs. No. 175.

Annual, with slender vertical root; stem 20–70 cm long, erect, sparsely covered with very short glandular hairs, simple or in lower part with 1–3 pairs of mostly short fertile branches; leaves thin, pale green, slightly glaucescent beneath, covered (somewhat more densely beneath) with scattered short appressed simple hairs and sessile capitate whitish glands as well as a few punctate yellow glands, the veins not prominent; lower and middle leaves ovate, with cordate or truncate base, obtuse at apex, with 6–8 pairs of large obtuse teeth, 1.5–3.3 cm long, 0.8–1.8 (2.3) cm wide; upper leaves lanceolate, acuminate, usually with acute teeth, gradually smaller and narrower toward summit, sublinear and often entire; lower petioles half as long again to twice as long as blade, the middle short; upper leaves sessile; petioles densely covered with fine capitate glands, in upper part also with long spreading simple hairs; cymes loose, few-flowered, forming a lax raceme; upper cymes 3–5-flowered, unbranched, in subremote pairs, the peduncles 3–10 mm long, usually shorter than bracts; other cymes 5–11 (13)-flowered in pairs 3–9 cm apart, on peduncles to 4.5 cm long, loosely dichotomous or trichotomous, with axes of first order 5–15 mm long, subtended by narrowly linear floral leaves 6–12 mm long; pedicels in terminal cymes 0.6–1.5 mm long, in lower cymes to 5 mm, in bifurcation to 12 mm; all axial

parts of inflorescence finely glandular-hairy; bracts linear-subulate, 3–5 mm long, with sparsely ciliate margin; calyx (4) 5.5–7 mm long, narrowly tubular in flower, ovoid in fruit, covered outside with fine (usually sparse) whitish capitate glands interspersed with a few round yellow glands and with spreading simple white hairs, these sometimes very dense in lower part; calyx incised in front to middle or beyond, rarely less; upper teeth ovate-triangular or triangular, abruptly attenuate to a rather long point, the middle tooth larger than lateral teeth, 1.5–1.8 (1.9) mm long, the lower teeth narrowly lanceolate, gradually long-acuminate, exceeding the upper, 2–2.5 mm long; corolla 7–8.5 mm long (pinkish-lilac or lilac-blue, with dark purple spots on lower lip?), the slender tube gradually expanding into neck 1–2 mm long and 2–2.5 mm wide, the limb completely exerted, the neck enclosed by calyx-teeth to about the middle; upper lip 1.2–1.5 mm long, shallowly cut into ovate lobes; middle lobe of lower lip ca. 3 mm long, 5 mm wide, the lateral lobes rounded, ca. 0.3 mm long, 1.5 mm wide; nutlets ellipsoid-obovoid, 1.8 mm long, 1 mm wide, pale brown, coarsely tuberculate, the tubercles flat, yellow. Fl. May–June; fr. June–August. (Plate XXIII, Figure 2.)

Lower and central mountain belts; gravelly and sandy slopes; pebble beds of mountain streams. — Centr. Asia: Kopet Dagh, apparently only in its central part (Chuli, Saratovka). **Gen. distr.:** Iran. (northern part): Elburz, Siakukh, Kokhrud mountains. Described from N. Iran, Paskalekh near Teheran. Type in Leningrad.

Series 3. *Ispahanicae* Pojark. — Flowers small; calyx 4–6 mm long, straight, with frontal incision 1/2–2/3 its length, the upper teeth 2/5–2/3 as long as tube, the lower teeth subulate; corolla 4.8–7.5 mm long, included mostly to limb (in one species to dilated part of tube); nutlets with finely tuberculate or granular surface; verticillasters subsessile, crowded at the end of elongate terminal internode of stem and axillary branches, forming a small but many-flowered inflorescence, this sometimes interrupted below; bracts lanceolate, flat, as long as calyx.

Besides the two Central Asian species, this series should also comprise *N. schirasiana* Boiss. (SW Iran), *N. eremophila* Hausskn. et Bornm. (SE Iran), and *N. kojeana* Rech. fil. (western part of central Iran).

56. *N. ispahanica* Boiss. Diagn. Ser. 1, 5 (1844) 23; id Fl. or. IV, 666; Benth. in DC. Prodr. XII, 394; Bobrov in Tr. Bot. sada, XLIV (1931) 72.

Annual, 5–15 cm high; stem erect or ascending, more or less densely covered with long fine crisp spreading white hairs and densely beset with very fine short-stipitate or sessile capitate glands (sometimes only glandular), simple or branching at base, branches all with inflorescences, often nearly equaling the stem; cauline leaves mostly on lower part of stem, 1–2 (2.8) cm long, 0.5–2.4 (2.8) cm wide, ovate or cordate, obtuse to rounded at apex, coarsely crenate, densely grayish-lanate beneath, less densely so to glabrescent above; petioles as long as blade, patent-hairy, short-glandular, lower floral leaves as long as semi-verticels, subsessile, ovate, acute, the upper oblong-elliptic to linear-lanceolate, bracteiform; verticillasters few-flowered, subsessile, the upper forming a terminal inflorescence, this dense, capitate, subglobose, rarely cylindrical, 1.8–2.3 cm long, 1–2 mm wide; stem and stronger axillary branches with 1 or 2 remote pairs of looser few-flowered semiverticels

below terminal head; bracts strict, linear, acuminate, equaling calyx, densely ciliate, with long fine implexed hairs; pedicels 1.5–3 mm long, elongating in fruit to 5–8 mm; calyx 4–5 (5.5) mm long, cylindrical in flower, campanulate in fruit, violet, glandular and thinly patent-hairy outside, the throat slightly oblique; teeth erect, long-ciliate, covered inside with long appressed hairs, the upper 1.3–1.7 mm long, oblong-triangular, acuminate, (2/5) 1/2 as long as tube, the lower 2.2–2.8 mm long, much narrower, linear-lanceolate, the incision between them reaching the middle of calyx; corolla 4.8–6 (6.5) mm long, included up to the limb, hairy outside; tube slightly curved, 2.8–4 mm long, rather abruptly expanding into infundibular neck 1.0–1.3 mm long and 1.2–1.5 mm wide; upper lip 1–1.25 mm long, erect, deeply cut into ovate concave lobes; lateral lobes of lower lip horizontally spreading, very small (ca. 0.3 mm long, 0.7 mm wide), obliquely semiorbicular, the middle lobe much larger, 1–1.5 mm long, 1.5–2 mm wide, with cordate base, entire or undulate-margined, concave, shallowly emarginate; upper stamens shorter than upper lip of corolla; nutlets 1.2–1.3 mm long, 0.6–0.7 mm wide, ellipsoid, brown, with numerous very small and nearly flat tubercles, the ventral side with an obtuse edge. Fl. (April?) May–June; fr. from first half of June.

Foothill and low mountain belt on fine earth (including saline) and gravelly slopes. — Centr. Asia: Mtn. Turkm. (Greater Balkhan Range). **Gen. distr.:** Iran. Described from vicinity of Isfahan in Iran. Type in Geneva, type duplicate in Leningrad.

57. *N. santoana* M. Pop. in Tr. Turkest. Gos. univ. 4 (1922) 57, 64.

Annual, with slender vertical root; stems 5–20 cm long, erect, robust, stout, sometimes simple but mostly branching at base, grayish-pubescent with rather long fine jointed simple hairs; branches arched-ascending, terminating in inflorescence, often equaling the stem in length and diameter; cauline leaves 2 or 3 pairs, very thin, the upper side smooth, greenish, rather densely covered with appressed simple hairs and with sparse round yellow resinous glands, the lower side with prominent main veins, grayish with similar but denser indument; lower and middle leaves 1–2 cm long and as wide, broadly ovate, with cordate base slightly decurrent on petiole, obtuse or rounded at apex, coarsely crenate, petioles of lower leaves as long as blade, those of middle leaves shorter; flowers in subsessile few-flowered semiverticels, these in 3–4 pairs at the ends of stem and branches; inflorescence dense, spicate-capitate, slightly one-sided, 10–25-flowered, 2–2.3 cm long, 1–1.5 cm wide, cylindrical or ovoid, 1 (2) remote verticillasters sometimes borne below inflorescence; floral leaves at base of the head ovate, resembling cauline but with acute teeth, rounded at base, smaller, to 1.4 cm long and as wide; floral leaves subtending semiverticels bractiform, 5–7 mm long, linear-subulate, acuminate, curved, the margin sparsely long-ciliate; bracts usually slightly shorter than calyx; pedicels 1–1.5 (2) mm long, sturdy, stoutish; calyx 4.5–5.2 mm long, with 13 thick nerves, with yellow, sessile, resinous glands and with jointed hairs mainly on nerves, straight, cylindrical in flower, ovoid in fruit, with slightly oblique throat, the 3 upper teeth distinctly shorter than the lower, 1–1.5 mm long, erect, oblong-triangular to sublanceolate, 1/4–1/3 as long as tube, the 2 lower teeth slightly curved, narrowly lanceolate, 1.3–1.8 mm long; calyx-tube with triangular acute incision 2/5–1/2 its length; all teeth acuminate, glabrous inside, ciliate; corolla white, pubescent outside, 7–7.5 mm long, included to middle or nearly to limb, the curved tube gradually expanding into narrow neck; shape and position of lips and their lobes as in the preceding

species but the middle lobe of lower lip large-toothed at margin; nutlets 1.5–1.7 mm long, 0.8–0.9 mm wide, oblong-ellipsoid to obovoid, brown, densely tuberculate, the tubercles very short and almost completely flat. Fl. and fr. in first half of June. (Plate XXV, Figure 1.)

Desert hills with outcrops of gypsiferous limestone. — Centr. Asia: Pam.-Al. Described from the Santo oil fields near Sary-Tau Range in Uzbekistan (the only location). Type (or its duplicate?) in Leningrad.

Section 7. **Schizocalyx** Pojark. sect. nov. in Addenda XIX, 358. — Sect. *Macronepeta* Benth. Lab. gen. ex sp. (1834) 467, 482; in DC Prodr. XII, 387, p. p. — Sect. *Eunepeta* § *Longiflorae* Boiss. p. p. (quoad descr. sed excl. *N. longiflora* Vent.); Briq. in Pflanzenfam. IV, 3a, 236, p. p. — Calyx narrowly tubular, curved, with strongly oblique or 2-lipped throat, deep and broad frontal incision and short teeth; corolla-tube long, abruptly expanding into short and broad neck; narrow part of tube $1\frac{1}{2}$ –3 times as long as calyx; middle lobe of lower lip concave, coarsely crenate; bracts much shorter than calyx; nutlets smooth or with minute smooth tubercles (strong magnifying glass!); flowers in remote cymes or verticillasters, the upper of which sometimes crowded in capitate inflorescence. Perennial, mostly strongly branching plants; leaves cordate or triangular, small, 2–3 (4) cm long. Type of the section: *N. fissa* C. A. M.

About twenty species distributed in the Caucasus, Iran and the eastern part of Asia Minor.

Note. This section was accepted here in the same scope as the subsection *Longiflorae* Boiss. but, as *N. longiflora* Vent. (i.e. type species) had to be excluded, the rise in rank necessitated a change of name. The drawing accompanying the first description of *N. longiflora* Vent. (Hort. Cels. 66, tab. 66) leaves no doubt that this species has very little in common with any other species included in the section bearing its name (cf. inflorescence, shape of calyx and leaves!). The herbarium specimen of this species in the Botanical Institute of the Academy of Sciences of the USSR, which was obtained from Olivier in Paris in 1804 (i.e. presumably a type duplicate), fully supports this approach and provides evidence that this species is very closely related to the cycle *N. mussinii* Henck. — *N. transcaucasica* Grossh.

Series 1. *Longitubae* Pojark. — Flowers in few-flowered, simple cymes (the upper sometimes in semiverticels) of which the upper 2–4 pairs sessile, crowded in a head, the others remote with peduncles 2 cm long; corolla 20–33 mm long, the strongly curved tube 2–3 times as long as calyx; nutlets scabrous or with minute flat tubercles; stems simple or slightly branching. Plants of lower and middle mountain belts.

In addition to the two Caucasian species, this series should also include *N. macrosiphon* Boiss. (SW Iran), *N. pulchra* Pojark. (S. Kurdistan) and *N. pycnantha* Benth. (Taurus Mountains in Asia Minor).

58. *N. longituba* Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 318.

Perennial; stems arched-ascending, 30–60 cm long, 2.5–3.5 mm across (at base), simple or branching, rather densely covered with sessile or short-stipitate whitish glands and,

mainly in lower part, with spreading simple jointed hairs, leafy in lower part where nodes 2-3 cm apart; middle internodes 7-10 cm long; cauline leaves broadly cordate, rounded at apex, with 6-9 large obtuse teeth per margin, 1-2.4 cm long, 1-2.8 cm wide, pale green, unicolored, densely covered above with fine appressed hairs, the lower side with scattered minute sessile whitish glands, the veins or the whole surface villous with 1-3-jointed simple hairs; lower petioles $2\frac{1}{2}$ times as long as blade, the upper leaves $\frac{1}{2}$ - $\frac{2}{3}$ as long; floral leaves, except the lowermost, bracteiform, 3-5 mm long, ovate-lanceolate or lanceolate, the upper usually violet-tinged; cymes 3-5-flowered, compact, not dichotomizing, the upper sessile or on very short peduncles, forming a (6) 10-12-flowered capitate inflorescence at summit of stem, the lower on peduncles 1.5-1.8 mm long, remote; bracts ovate-lanceolate, rather abruptly attenuate to a short point, the margin beset with white jointed hairs; pedicels 0.5-2 mm long; calyx 7-9 mm long, violet, 15-nerved; tube densely covered with sessile yellowish glands and on nerves with spreading white 2-3-jointed hairs, the frontal incision $\frac{1}{2}$ - $\frac{2}{3}$ its length; teeth broadly scarious-margined, the 3 upper broadly ovate, 1-1.6 mm long, abruptly short-pointed, $\frac{1}{6}$ - $\frac{2}{9}$ as long as tube, the 2 lower longer and narrower, ovate-lanceolate or ovate, 1.7-1.8 mm long; corolla (20) 22-27 mm long, blue, the slender tube 3- $3\frac{1}{2}$ as long as the limb and $2\frac{1}{2}$ times as long as calyx; upper lip ca. 2 mm long, cleft to $\frac{2}{3}$, the middle lobe dilated, the lateral lobes 0.7-0.8 mm long, 2.5-3 mm wide; nutlets ellipsoid, 2.3-2.5 mm long, 1.3-1.5 mm wide, 3-angled, brown, with minute flat tubercles visible under high magnification. Fl. and fr. first half of August. (Plate XXI, Figure 2.)

Sliding taluses in central mountain belt. — Caucasus: E. Transc. (Nukhi; Geok-Chai River; Ismailly). Endemic. Described from northern part of Azerbaïdzhān near Upper Dashagil village, not far from Nukhi River. Type in Leningrad.

59. *N. sosnovskyi* Asker. in Bot. mat. gerb. Bot. inst. AN SSSR, XVI (1954).

Perennial; root oblique, fibrous, imperceptibly passing above into a very short rhizome, this bearing a few closely approximate brown squamiform leaves; stem 25-35 cm long, solitary, ascending, straight or slightly curved, with horizontal brown base buried in rubble, violet-tinged above, the lower internodes 1.5-2 cm, the middle 5-8 mm long; branches in axils of lower leaves sterile, leafy; 2-3 pairs of axillary branches fertile, with 1 or 2 pairs of remote, small leaves and inflorescence at the end; stems, branches and petioles beset with very short sessile or short-stipitate whitish capitate glands and short white spreading simple proximally thickened hairs; leaves firm, glaucous, with prominent main veins on lower side, sometimes violet, densely covered on both sides with simple jointed hairs, these fine and appressed above, spreading and coarser beneath; lower cauline leaves 1.3-2.3 cm long, 1.8-2.3 cm wide, cordate, with deeply incised base and rounded apex, the margin with 5-6 large rounded crenae, the petioles approximately as long as blade; upper leaves subsessile, ovate, more finely crenate; floral leaves sessile, ovate, mostly entire, acute, the uppermost bracteiform; inflorescence consisting of a dense terminal head 2-3.5 cm long, 3-3.5 cm wide, and sometimes a remote pair of 3-5-flowered short-peduncled cymes; inflorescences on axillary branches terminal heads not smaller than on stem or more often composed of 1 or 2 verticillasters; bracts narrowly elliptic to linear-lanceolate, 4-7 mm long, long-acuminate, terminating in a rigid point; calyx 9-12 mm long, violet, densely covered with yellow sessile glands, the nerves with scattered spreading 2-3-jointed

white simple hairs, the frontal incision reaching the middle; upper teeth ovate or ovate-triangular, 1.5–2.5 mm long, acute, $2/11-1/4$ as long as tube, the lower oblong-lanceolate, acuminate, 3–3.25 mm long; corolla 21–27 mm long, the slender tube exerted more than half its length, the neck 3–4 mm long; upper lip ca. 3 mm long, cut to the middle into 2 porrect lobes; middle lobe of lower lip 5–6 mm long, 8–9 mm wide, with deeply cordate base, the lateral lobes 0.4–0.5 mm long, 2.5–3 mm wide; nutlets ellipsoid, attenuate at both ends, 2–2.5 mm long, 1 mm wide, brown, nearly smooth. Fl. (June) first half of July; fr. from August.

Pebbles in lower mountain belt. — Caucasus: E. Transc. (northeastern part). Endemic. Described from vicinity of Alty-Agach village, Mutyanka River, Khizinsk district in E. Azerbaidzhan (so far known only from this locality). Type in Baku.

Cycle 1. *Fissae* Pojark. — Flowers in remote cymes, these simple or once or twice (thrice) loosely dichotomously branching, with peduncles 0.4–1 (the upper) to 4.5 cm long; aggregate inflorescence a very sparse panicle, rarely a raceme; corolla 11–20 cm long, the tube $1\frac{1}{2}$ –2 ($2\frac{1}{2}$) times as long as calyx; nutlets with very numerous minute
395 (strong magnifying glass!) flat pellucid tubercles. Plants of middle and lower mountain belt covering the Caucasus and Southwest Asia (from Iran to eastern part of Asia Minor).

60. *N. fissa* C. A. M. Verzeichn. Pfl. Cauc. kasp. Meer. (1831) 93; Benth. Lab. gen. et sp. 737 (non 471). — *N. rariflora* C. A. M. in sched. non C. Koch. — *N. laxa* Benth. l. c. 483 (excl. syn.). — *N. teucrifolia* auct.: Ldb. Fl. Ross. III (1846–1851) 378; Benth. in DC Prodr. XII, 389, p. p.; Lipsk. Fl. Kavk. 420, p. p.; N. Pop. in Tr. Bot. sada Yur'evsk. univ. XIV, p. p.; Grossg. Fl. Kavk. III, 254, p. p.; idem, Opred. rast. Kavk. 331, p. p., non Willd. (1809).

Perennial; root woody, coarsely fibrous; stems 50–90 cm long, with short simple hairs, densely leafy in lower part, with middle internodes 5–8 (11) cm long, strongly branching, mostly from base; axillary branches long, with few pairs of cymes; cauline leaves ovate-triangular or oblong-ovate to lanceolate, with truncate or shallowly cordate base, obtuse or acute, each margin with 6–7 large obtuse or acute teeth, 1.5–4 cm long, 1.2–3.5 cm wide (the uppermost at base of upper axillary branches much reduced, entire, sublanceolate), the upper side densely covered with very short and very fine appressed hairs, finally glabrescent, the lower side at first with usually dense indument of equally short but coarser spreading hairs, these sometimes persistent on the veins; lower petioles half as long again as the blade, the upper $1/5-1/3$ the length of blade; floral leaves, except sometimes the lowermost, small, narrow, entire, bracteiform; aggregate inflorescence (including inflorescences on axillary branches) paniculate, very lax, to $2/3-3/4$ of whole plant length; upper cymes 3–7-flowered, sometimes unbranched, the others loosely dichotomous with axes of first order sometimes developing into elongate bostryx, 1–4 cm long; peduncles of cymes slender, divergent to horizontal, the upper 1–1.5 cm long, the others to 5 cm; bracts 1.5–2 mm long, narrow, acuminate, mostly violet; pedicels 0.8–1 mm, that of central flower to 1.5 mm long; calyx (6.5) 7–8 mm long, incised nearly to the middle, often nearly to $1/3$, densely covered with sessile yellowish glands and spreading (2) 3-jointed hairs, the upper teeth ($1/6$) $2/11-2/9$ as long as tube (1–1.3 mm long), ovate or ovate-lanceolate, abruptly attenuate to a short point, the lower 1.3–1.5 mm long, lanceolate, short-acuminate;

corolla blue, 17.5–19 mm long, the tube exerted from calyx to half its length or slightly more, expanding into neck 3–4 mm long and as wide; upper lip ca. 2.5 mm long, cleft to 2/3–3/5 into obtuse lobes; middle lobe of lower lip 3–3.8 mm long, 5.5–6.5 mm wide, the lateral lobes 0.7–1 mm long, 1–1.2 mm wide; nutlets ellipsoid, 3-angled, ca. 2 mm long, 1 mm wide, very finely punctate-tuberculate.

Exposed dry, gravelly and stony places in lower and central mountain belt. — Caucasus: S. Transc. (southwestern part of Azerbaidzhan, Dzhebrail and Gadrud areas), Tal. **Gen. distr.:** Iran. (Astrabad province, Elburz Range). Described from near Sivirs in Talysh. Type in Leningrad.

Notes. 1) This species was reported by Karelin (1839) for “Northern Turkmenia” and there is a herbarium specimen with similar inscription; but to this day nobody else has found the plant in Turkmenia and it must be assumed that it does not occur there.

2) Species most closely related to *N. fissa* C.A.M. are *N. microphylla* Stapf (C. Iran) and *N. szovitsiana* Pojark. (*N. longiflora* Boiss. p. p. non Vent.) from N. Iran (Kurdistan).

61. *N. trautvetteri* Boiss. et Buhse in Nouv. Mém. Soc. Nat. Mosc. XII (1860) 175; Boiss. Fl. or. IV, 647, p. p. (quoad typum). — *N. leptoclada* Trautv. in Tr. Bot. sada, II (1873) 480; Boiss. l. c., 648; N. Pop. in Tr. Bot. sada Yur'evsk. univ. XIV, 234; Grossg. Fl. Kavk. III, 294; idem, Opred. rast. Kavk. 331. — Exs.: Pl. or. exs. No. 216.

Perennial; root tough, woody, not forming a rhizome; stems few, 45–100 cm long, 2–5 mm thick, usually branching, mostly from base, beset (like all other parts of the plant) with small yellowish capitate sessile glands, leafy in lower part and densely covered with coarse subsetaceous white spreading hairs; axillary branches long, leafless, with few pairs of cymes; cauline leaves 1.5–4.5 cm long, 1.2–4 cm wide, broad-ovate to suborbicular-ovate, rounded or obtuse at apex, deeply cordate at base, each margin with 6–9 large crenae, the upper side with rather dense but inconspicuous indument of rather long, very fine, more or less implexed hairs, the lower side at first covered all over with long white fugacious hairs, the veins with mostly persistent subsetaceous hairs; petioles white-hispid, the lower about half as long again as blade, the upper short; floral leaves small, sessile, oblong-ovate to narrowly elliptic, entire or the lower with few teeth; aggregate inflorescence a large, broad, loose panicle; cymes remote, all except the upper dichotomously branching, the axes of first order to 2 cm long, sometimes repeatedly dichotomous or bostryciform; bracts ovate-elliptic or elliptic, 2–3 mm long; pedicels 0.7–1 mm long; calyx 6–7.5 mm long, violet, densely covered with whitish or yellowish sessile glands and sparse spreading (2) 3-jointed simple hairs, frontally incised to the middle; teeth with scarious margin, the upper 0.8–1 mm long, ovate or broadly ovate, 2/15–1/6 times as long as tube, mucronate, the lower 1–1.5 mm long, lanceolate or narrowly lanceolate, acuminate; corolla 15.5–17 mm long, the slender curved tube exerted to the middle, abruptly attenuate (?) into neck 2.5–3 mm long and wide; upper lip 2.3–3 mm long, cleft to 1/2–2/3; middle lobe of lower lip 3–4 mm long, 4–6 mm wide, with large triangular teeth at margin, the lateral lobes 0.7–1 mm long, 2–3 mm wide; nutlets brown, 1.8–2 mm long, 1 mm wide, ellipsoid, minutely tuberculate, the tubercles rather pale and very flat. Fl. May–June; fr. second half of June to July.

Dry exposed slopes in middle mountain belt. — Caucasus: S. Transc. (Nakhichevan

ASSR and SE Armenia). **Gen. distr.:** N. Iran (Karadag). Described from near Alliar in N. Iran. Type in Leningrad.

Note. A comparison of the type specimens of *N. trautvetteri* Boiss. et Buhse and *N. leptoclada* leaves no doubt that they are identical. Yet, with the exception of Popov (1914), nobody has compared them as related species. This is due to the fact that *N. trautvetteri* has so far been listed by all investigators of the flora of the Caucasus as *N. leptoclada* Trautv. (described from Bilyav village in Nakhichevan ASSR) whereas the name *N. trautvetteri* has been associated with a species differing markedly from that to which it had been originally applied — *N. velutina* Pojark. (see Note to this species).

62. *N. velutina* Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 312. — *N. trautvetteri* Boiss. Fl. or. IV (1879) 647, p. p. (quoad pl. e Koschadara), non Boiss. et Buhse (1860); auct. fl. Cauc.: N. Pop. in Tr. Bot. sada Yur'evsk. univ. XIV, 234; Grossg. Fl. Kavk. III, 294, p. p.; idem, Opred. rast. Kavk. 331, p. p., non Boiss. et Buhse (1860).

Perennial; root woody, vertical, 2 cm across in upper part; stems 1-4, 30-120 cm long, 2-8 mm thick at base, densely velutinous, the very short simple (eglandular) hairs forming a grayish powdery bloom, with internodes in middle part 5-10 cm long, branching from base but sometimes simple; branches usually long, leafy, terminating in racemiform or paniculate inflorescence; leaves broadly ovate, with truncate or cuneate or rarely cordate base, obtuse at apex, with 5-9 large crenae per margin, the upper side bright green, at first rather densely hairy, the hairs appressed, very fine, discernible only under high magnification, later sometimes almost completely disappearing, the lower side gray, velutinous
398 all over; cauline leaves 1.7-5 cm long, 1.3-4.3 cm wide; petioles $1\frac{1}{2}$ -2 times as long as blade, the upper $\frac{1}{4}$ - $\frac{2}{5}$ as long as blade; floral leaves much smaller, sessile, the lowermost ca. 1 cm, ovate or oblong, dentate or entire, the others bracteiform, 3-4 mm long, 1-1.5 mm wide, oblong-elliptic; flowers in 3-7-flowered or many-flowered cymes, these except the uppermost dichotomously branching, often repeatedly to form a bostryx; aggregate inflorescence (including inflorescences of axillary branches) a very lax panicle to 50-80 cm long; peduncles of upper cymes 2.5-10 mm long, others 1.5-4 cm long; bracts oblong or ovate-elliptic, 1.5-2 mm long, ca. 1 mm wide, with ciliolate margin, velutinous-hairy like other parts of inflorescence; pedicels 0.7-1.5 mm long; calyx 5.5-7 mm long, violet, the tube densely beset with sessile glands and on the nerves also with simple spreading white 2-3-jointed hairs; the frontal incision $\frac{1}{3}$ - $\frac{2}{5}$ ($\frac{1}{2}$) its length; teeth with broad membranous rim, the upper broadly ovate, $\frac{1}{6}$ - $\frac{1}{5}$ ($\frac{2}{9}$) as long as tube, short-acuminate or abruptly attenuate to a short point, the lower narrower, oblong-ovate, slightly longer; corolla blue, 11.5-15 mm long, with tube exerted to $\frac{1}{3}$ - $\frac{2}{5}$ its length, abruptly expanding above into neck 2-3 mm long and 2.5-3.5 mm wide; upper lip 2.3 mm long, nearly flat, cut to $\frac{2}{3}$ into 2 obtuse lobes; middle lobe of lower lip 3.3-4 mm long, 5-6 mm wide, the lateral lobes broad, 0.6-0.8 mm long, ca. 2 mm wide; nutlets broadly ellipsoid, 2 mm long, 1.5 mm wide, obtusely 3-angled, brown, with minute flat tubercles. Fl. June-August; fr. from July. (Plate XXI, Figure 3.)

Lower and middle mountain belt, at altitudes of 900-1700 m, exposed fine earth and gravelly-stony slopes. — Caucasus: S. Transc. (Nakhichevan ASSR and E. Armenia — Daralagez). Endemic. Described from Nakhichevan ASSR, Koshadara River. Type in Leningrad.

Note. The first specimens of this species, collected by Shovits along the Koshdara River, were quite erroneously included by Boissier (Fl. or. IV, 647) in *N. trautvetteri* Boiss. et Buhse, described earlier from Alliar village in Karadag (Iranian Azerbaidzhan), and ever since this species has been treated by all botanists as *N. trautvetteri*. In actual fact the genuine *N. trautvetteri* differs from *N. velutina* Pojark. in a number of characters: 1) a completely different indument of leaves, stems and petioles, consisting of long spreading glandular hairs, interspersed with small sessile or subsessile capitate glands; 2) longer and much narrower, lanceolate calyx-teeth, and 3) much narrower bracts covered with glandular hairs. Specimens of the genuine *N. trautvetteri* Boiss. et Buhse from Transcaucasia were reported by students of the Caucasian flora under the name *N. leptoclada* Trautv. which is merely a synonym of *N. trautvetteri* Boiss. et Buhse (see Note to *N. trautvetteri*).

63. *N. daghestanica* Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 315. — *N. teucრიifolia* auct. fl. cauc.: Lipsk. Fl. Kavk. (1899) 422; N. Pop. in Tr. Bot. sada Yur'evsk. univ. XIV, 234; Grossg. Fl. Kavk. III, 294; idem, Opred. rast. Kavk. 333, p. p. (quoad pl. daghest.) non Willd. (1809).

Perennial; stems 40–70 cm long, arcuately ascending from nearly horizontal base, 2–3 cm across, simple or branching, in lower part leafy, violet, very shortly and densely hairy, green, with sparser pubescence above; internodes 7–11 cm long; branches fertile, mostly short, with 1 or 2 pairs of small leaves in lower part; cauline leaves 1.5–2.5 cm long, 1.2–2.2 cm wide, ovate-triangular, with broadly cordate, rarely truncate or cuneate base, obtuse, at margin with 5–7 large crenae, the upper side with minute (magnifying glass!) fine appressed hairs, the lower side more densely covered with thicker short 1–3-jointed hairs, often purple, with prominent main veins; petioles with short hairs sometimes interspersed with long hairs, the lower half as long again as blade, the upper (1/3) 1/2 the length of blade; floral leaves 3.5–5 mm long, the lower resembling cauline leaves, dentate, the others bracteiform, lanceolate, usually violet-tinged; flowers in 3–5-flowered cymes, these in 5–9 pairs forming a lax raceme, usually compact, rarely the lower loosely dichotomous, the upper about 1–1.5 cm apart, sessile or on peduncles 3–7 mm long, others 3–5 cm apart and on peduncles 2.3–5 cm long; bracts narrowly lanceolate, acuminate, violet, 2.5–3.5 mm long; pedicels 1.5–2 mm, in bifurcation 2.5–5.5 mm long; calyx 6.5–8 mm long, the tube densely covered with round sessile yellow glands, the nerves and teeth with spreading white villous jointed hairs, incised at front to the middle or slightly deeper; teeth membranous at margin, the upper triangular- or lanceolate-ovate, 2/9–2/7 as long as tube (1.3–2 mm long, 0.6–0.7 mm wide), acute or short-acuminate, the lower narrowly lanceolate, 1.5–2.2 mm long, long-acuminate; corolla blue, 16.5–18 mm long, pubescent outside, the slender curved tube exerted to the middle, abruptly expanding into neck (3) 3.5–4.5 mm long and as wide; upper lip 2–3 mm long, cut to 2/3 into obtuse lobes; lower lip with middle lobe 3–4 mm long and 5–6 mm wide, the lateral lobes 0.7–0.8 mm long, 2–2.5 mm wide; upper stamens as long as upper lip of corolla or slightly shorter; nutlets brown, oblong-ellipsoid, 2 mm long, 1 mm wide, with small (high magnification!) round flattish tubercles. Fl. (?) July–August; fr. from first half of July.

Lower mountain belt; exposed slopes, gravelly taluses and bluffs. — Caucasus: E. Transc. (Kuba region), Dag. Endemic. Described from S. Dagestan, Akhta village. Type in Leningrad.

Note. Of all the Caucasian species of the section *Schizonepeta* combined under the name of *N. teucriifolia* Willd., *N. daghestanica* and the closely related *N. iberica* most closely approach the diagnosis of *N. teucriifolia*. However, without examination of the original specimens, it is at present impossible to ascertain what in fact represents *N. teucriifolia* that was described from Turkish Armenia: too many different species come under this name. There are no grounds for assuming that *N. teucriifolia* occurs in the USSR. Of the species distributed in Turkish Armenia, two conform most closely to the description of *N. teucriifolia*, namely *N. calvertii* Boiss. (from near Erzerum) and *N. rariflora* C. Koch (from Ol'tin district). Thus Boissier, who had seen the originals, may have been right in placing *N. rariflora* C. Koch among synonyms of *N. teucriifolia* Willd. *N. calvertii* Boiss. and *N. galatica* Bornm. (from the northeastern part of Asia Minor) are most closely akin to *N. daghestanica* and *N. iberica*.

64. *N. iberica* Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 318. — *N. teucriifolia* auct.: Grossh. et Schischk. in Sched. pl. or. exs. No. 91; Grossg. Fl. Kavk. III, 294, p. p.; idem, Opred. rast. Kavk. 331, p. p.; Sosnovsk. Fl. Gruz. VII, 294. — Ic.: Fl. Gruz. VII, fig. 319. — Exs.: Pl. or. exs. No. 91.

Perennial; root vertical, woody, coarsely fibrous, more or less twisted; stems few, 30–60 cm long, 1.8–3 mm thick at base, erect, scabrous, with short dense hairs, violet in lower part, simple or with few fertile axillary branches; cauline leaves triangular, rarely ovate-triangular, obtuse or acute at apex, mostly deeply cordate, rarely truncate or cuneate at base, with 7–10 large ovate or oblong-ovate obtuse or acute teeth at each margin, scabrous on both sides with short hairs, spreading, these more copious and coarser beneath, finer, 401 subappressed above; lower leaves to 8 mm long, 3 mm wide, oblong, long-acuminate, with few teeth, the upper subulate-sublanceolate, violet; inflorescence of 5–10 cymes, mostly a fairly loose raceme; upper cymes 3–5-flowered, approximate, on peduncles 3–10 mm long, the lower 2–4.5 cm apart, on peduncles 1.5–3.5 cm long, often dichotomously branching, the axes of first order sometimes transformed into bostryces 1.5–4 cm long, all axial parts of inflorescence scabrous, with short whitish hairs; bracts lanceolate, acuminate, long-mucronate, ciliate, half as long again as pedicels, these 1.2–1.7 mm long, in bifurcation 2.5 mm long; calyx (7.5) 9–10.5 mm long, more or less suffused with violet, incised to the middle, covered with spreading hairs and small sessile glands; teeth with broad scarious sparsely ciliate margin, the upper triangular or ovate-triangular, (1/6) 2/11–2/9 as long as tube, the lower lanceolate, long-acuminate, mucronate; corolla 17.5–20 mm long, blue, pubescent, the tube exerted to 2/5–1/3 its length, expanding into neck 3–4 mm long and as wide; upper lip 3 mm long, cut to 2/3 into obovate lobes; middle lobe of lower lip 3.5–4 mm long, 6 mm wide, the lateral lobes 0.6–0.8 mm long, 2.5–3 mm wide; upper stamens distinctly (1.2 mm) longer than upper lip of corolla; nutlets ellipsoid, 1.5 mm long, 1 mm wide, brown, with numerous small flat tubercles. Fl. (June?) July; fr. from second half of July.

Dry slopes in central mountain belt. — Caucasus: E. Transc. (Trialet Range, vicinity of Tbilisi). Endemic. Described from vicinity of Tbilisi. Type in Leningrad.

Series 2. *Brevifoliae* Pojark. — Flowers in compact semiverticels; upper pairs of semiverticels sessile, crowded in a globular or ovoid head, the lower 1–3 pairs remote, with

short peduncles; corolla 15–20 mm long, the tube about half as long again as calyx; nutlets smooth. Plants usually branching from base, with more or less arched stems and branches. Habitats in alpine and subalpine belts.

Two Caucasian species belong to this series.

65. *N. brevifolia* C. A. M. Verzeichn. Pfl. Cauc. kasp. Meer. (1831) 93; Benth. Lab. gen. et sp. 483; C. Koch in Linnaea, XXI, 675; Boiss. Fl. or. IV, 147; N. Pop. in Tr. Bot. sada Yur'evsk. univ. XIV, 234; Grossg. Fl. Kavk. X, 293; idem, Opred. rast. Kavk. 331. — *N. lamiifolia* auct.: Benth. in DC. Prodr. XII (1848) 390, p. p. (quoad pl. Meyer.); Ldb. Fl. Ross. III, 379 (excl. syn. Benth. et Tourn.), non Willd. (1809). — *N. alexeenkoi* 402 Woron. apud Grossh. Fl. Kavk. III (1932) 293, nom nud. in synon. — Exs.: Fl. Cauc. exs. No. 217.

Perennial; root brown, woody but not tough, fibrous, twisted, passing above into a branching rhizome, this and stem base buried in rubble, covered with small dark brown squamiform leaves; stems many, 15–45 cm long, ascending, often curved or more or less flexuous, densely covered, especially in lower part, with very short spreading simple hairs and minute sessile whitish glands forming a powdery bloom, simple or (usually only in lower part) with long fertile axillary branches; lower internodes 1.5–3 cm, the upper 5–7 cm long; cauline leaves 9–17 mm long, 7–17 mm wide, broadly ovate, with broadly cordate or truncate base, obtuse or rounded at apex, with 4–5 (6) large obtuse marginal teeth, densely covered on both sides with very short hairs, these appressed, 3–5-jointed above, shorter, spreading, 1–3-jointed beneath, intermixed with sparse small sessile capitate whitish glands and yellow punctate glands; lower petioles $1\frac{1}{2}$ –2 times as long as blade, the upper $2\frac{1}{5}$ – $1\frac{1}{2}$ as long; semiverticels few-flowered, the upper sessile, approximate at summit to form a small, usually loose, 8–14-flowered head, the other 1–2 (3) pairs remote, peduncled; upper peduncles 2–5 mm, the lower 12–25 mm long; lower floral leaves resembling upper cauline leaves, the upper smaller, oblong, dentate or entire, to fully bracteiform and then lanceolate, violet; bracts $2\frac{1}{5}$ – $1\frac{1}{2}$ as long as calyx, tapering to a long point; calyx 7.5–9 mm long, tubular, slightly dilated above, densely covered outside, like the bracts, with small sessile whitish glands, the nerves with simple jointed spreading basally thickened hairs, the wide frontal incision reaching the middle and sometimes beyond; teeth cuspidate (but not spinescent), the upper 3 ovate or ovate-triangular, mostly abruptly attenuate, $1\frac{1}{5}$ – $1\frac{1}{4}$ as long as tube, the lower 2 narrower to triangular-lanceolate; corolla 15–20 mm long, bright blue, pubescent outside; tube slender, curved, exserted to $1\frac{1}{3}$ – $2\frac{1}{5}$, abruptly 405 expanding into neck 3–3.5 mm long and 3.5–4 mm wide; upper lip bent forward, flat, 2.3–2.5 mm long, cut to $\frac{2}{3}$ into obtuse obovate lobes; middle lobe of lower lip 4.5–5 mm long, 7–8 mm wide, the lateral lobes 1 mm long, 2.5–3 mm wide; nutlets brown, smooth, oblong-obovoid, 3-angled, 2.5–2.7 mm long, 1 mm wide. Fl. June–August; fr. from second half of July.

Alpine and subalpine belts, on gravelly and stony sliding taluses and on slopes. — Caucasus: Main Range, southeastern part. Endemic. Described from Tifandag Mountain. Type in Leningrad.

Note. The specimen published in "Flora Caucasica" (exs. No. 217) from Dibrar Mountain (southern tip of Main Range) is not typical: it differs from all other available specimens in the much denser indument of all parts; the hairs on stems and calyx are broad,



PLATE XXIII. 1 — *Nepeta grossheimii* Pojark., general aspect and flower; 2 — *N. saccharata* Bge., summit of plant, flower, calyx in front view and nutlet from ventral side; 3 — *N. amoena* Stapf, calyx in front view.

flat, and comparatively long. Moreover, the leaves of this specimen are shaped differently, often broader than long and triangular in outline. More material from this area would be desirable.

66. *N. lamiifolia* Willd. Enum. pl. Berol. (1809) 602; Benth. Lab. gen. et sp. 484 et in DC. Prodr. XII, 300, p. p. quoad pl. armen.; Boiss. Fl. or. IV, 645.

Perennial; very similar to the preceding species, distinguished mainly by its large, dense, many-flowered heads and triangular leaves; stems 20–60 cm long, to 3 mm across; middle internodes to 12 cm long; leaves to 3.5 cm long and wide, mainly triangular-ovate, with truncate or broadly cordate base, tapering toward apex, obtuse to subacute, the margin with large acute or rarely obtuse teeth; inflorescence consisting of a compact (20) 30–50-flowered head 2–2.5 cm long and wide (without corollas) and 2–4 pairs of remote semiverticels; upper peduncles 3–6 (8) mm long, the lower 18–30 mm; axillary branches almost leafless, shorter than in *N. brevifolia*, terminating in a rather many-flowered head and 1 or 2 remote verticillasters. Otherwise, like the preceding species. Fl. July–August; fr. from end of July.

Gravelly taluses in subalpine and alpine belts. — Caucasus: S. Transc. (Akhmagan Range and mountains in vicinity of Lake Sevan). **Gen. distr.:** Arm.-Kurd. Described from Armenia. Type in Berlin.

Note. *N. lamiifolia* was described by Willdenow from specimens cultivated in the Berlin botanical garden, the reported provenance being Armenia. Leading taxonomists, who had access to both Willdenow's originals and to typical specimens of *N. brevifolia* 406 C.A.M., differ in their evaluation of the relationship between the species concerned. Whereas Bentham (in DC. Prodr. XII, 390) and Ledebour (Fl. Ross. III, 379) found it feasible to unite *N. lamiifolia* and *N. brevifolia* C.A.M. into one species (Ledebour noted only a few distinctions in vesture), Boissier regarded them as separate species and even stressed the absence of any kinship between them. In the detailed description of *N. lamiifolia* in "Flora orientalis," apparently based on Willdenow's originals (Boissier does not cite any other specimens), there are no significant differences as compared with our specimens collected in Armenia that are unquestionably close to *N. brevifolia* but differ from it in the above-noted features. On this basis the Armenian plant should be considered as a separate species.

Section 8. **Orthonepeta** Benth. Lab. gen. et sp. (1834) 467; Briq. in Pflanzenfam. IV, 3a, 238. — Flowers bisexual and female (with normal pistil and 4 staminodes); calyx straight, narrowly cylindrical in flower, tubular-ovoid, ribbed in fruit; throat straight, rarely slightly oblique; teeth erect, lanceolate-subulate, aristate; corolla with curved tube abruptly expanding into a broad neck, included to the base of the neck or slightly higher, in female flowers nearly up to the limb; middle lobe of lower lip obliquely descending, concave, bearded and without swelling at base, the margin cut into large teeth; nutlets tuberculate, sometimes only at apex, rarely almost smooth; bracts narrow, shorter than calyx; flowers in more or less remote cymes clustered in narrow racemes at ends of stem and axillary branches; central flower of cyme pedicellate. Perennial, high plants, mostly with long virgate axillary branches.

About 15 species mainly in the Mediterranean countries and Southwest Asia.

Series 1. *Pannonicae* Pojark. — Corolla violet or white; nutlets hairy at apex.

Besides *N. pannonica* L., this series contains *N. nuda* L. (SE Europe), *N. latifolia* L. (Spain) and *N. violacea* L. (S. Europe and, possibly, Asia Minor).

67. *N. pannonica* L. Sp. pl. (1753) 570; Jacq. Fl. austr. II, 18; Bess. Enum. pl. Volhyn. 23; Bge. in Ldb. Fl. Alt. II, 403. — *N. paniculata* Crantz, Stirp. Austr. (1769) 270. — *Cataria nuda* Moench, Meth. (1794) 388. — *N. ucrainica* auct.: M. B. Fl. taur.-cauc. II (1808) 41; Bge. in Ldb. Fl. Alt. II, 403, non L. — *N. nuda* auct.: M. B. l. c. 42; C. A. M. Verzeichn. Pfl. Cauc. kasp. Meer. 92; C. Koch in Linnaea, XXI, 676; Boiss. Fl. or. IV, 663, p. min. p.; Shmal'g. Fl. II, 322; Kryl. Fl. Zap. Sib. IX, 2309; Grossg. Fl. Kavk. 292, p. p.; idem, Opred. rast. Kavk. 330, p. p. non L. — *N. violacea* auct.: Bge. in Ldb. Fl. Alt. II (1830) 403; C. Koch in Linnaea, XXI, 677, non L. — *N. nuda* α . *grandiflora* Benth. Lab. gen. et sp. (1834) 486, p. p.; id. in DC. Prodr. XII, 387, p. p.; Ldb. Fl. Ross. III, 377, p. maxim. p. — *N. nuda* β . *pauciflora* Benth. l. c. (1834) 486; Ldb. Fl. Ross. III, 377, p. p. — *N. nuda* β , *ucrainica* C. Koch, l. c. 296. — *N. barbata* Rgl. et Winkl. in Tr. Bot. sada, VI (1879) 296; O. and B. Fedch. Perech. rast. Turk. V, 143. — *N. turkestanica* Gandog. in Bull. Soc. Bot. Franc. 60 (1913) 26. — *N. nuda* ssp. *pannonica* var. *paniculata* Gams in Hegi, Ill. Fl. V, 4, 2372. — Ic.: Jacq. l. c. tab. 129; Rchb. Ic. Fl. Germ. tab. 1243, fig. III; Fl. Yugovost. VI, fig. 605; Viznachn. rosl. URSR, fig. 244. — Exs.: GRF, No. 733; Fl. pol. exs. No. 380; Fl. exs. Austr.-Hung. No. 2948.

Perennial; root oblique, woody, nodose, branching; stems many, 50–120 cm long, 4–7 mm across, sturdy, 4-angled, canaliculate, glabrous or subglabrous in lower part, more or less densely covered above with very short simple spreading basally thickened hairs, with internodes 4–12 cm long, sometimes unbranched or with slender sterile branches in lower part, always branching in upper part; branches often long, virgate, bearing numerous remote cymes; cauline leaves sessile (the upper) or nearly so (only lowermost with distinct petioles to 10–12 mm long), to 10 cm long, 3.5 cm wide, thin to fairly thick, bright or pale green, slightly glaucescent beneath, with prominent veins and with numerous punctate glands, covered on both sides with very short hairs, rather densely at first, later glabrescent above, with pubescent veins and scattered hairs between them on the lower side, oblong-ovate or oblong-elliptic to lanceolate, with shallowly cordate or truncate base, obtuse, acute or acuminate, the margin crenate or dentate; only the lowermost floral leaves sometimes resembling the upper cauline, often all bracteiform, linear-subulate, 3–10 mm long; cymes numerous, loose, the upper (sometimes most) 2–5-flowered, on peduncles 2–5 mm long, subremote, the lower (rarely most) many-flowered (10–25), once or twice dichotomously branching, on peduncles ca. 10–12 mm long; bracts narrowly linear, 2–2.5 mm long; pedicels 0.3–0.5 mm long; calyx 4–5 mm long, tubular in flower, ovoid in fruit, straight, green or more or less suffused with violet, densely covered with short spreading hairs (like bracts and axial parts of inflorescence) and with round sessile resinous glands; teeth 3/5–1/2 as long as tube, narrowly and inconspicuously scarious-margined; corolla hairy outside, 8–9 mm long in bisexual flowers; tube 3–3.5 mm long, abruptly expanding into neck 2.3–2.5 mm long, 3–3.8 mm wide, included to base of neck or slightly higher; upper lip 2.5–2.8 mm long, cut into 2 obtuse ovate lobes; lower lip with middle lobe 2.5–3 mm long, 4.5–5 mm wide, the triangular lateral lobes 1–1.3 mm long, 2–2.5 mm wide; corolla varying in color from pale violet or pink to white; in female flowers corolla

5-6.5 mm long, included nearly to the limb; the lower lip relatively less developed; stamens with rounded sterile scarious rudiments of anthers, these included in neck of tube; style twice as long as upper lip; nutlets ellipsoid, 3-angled, 1.5-2.2 mm long, 1-1.2 mm wide, brown, smooth or mainly in upper part and on the back with sparse flat tubercles, at apex always with acute papilliform protuberances and sparse hairs. Fl. June to first half of September; fr. July-September.

Chernozem and steppe strips on meadows, steppes, thickets, forest margins, sometimes open woods, exposed slopes in mountain regions in lower and central belts on meadow and steppe slopes. — European part: V.-Kama, U. Dnp., M. Dnp., V.-Don, Transv., U. Dns., Bes., Bl., Crim., L. Don, L.V.; Caucasus: Cisc., Dag., E., W. and S. (northern part) Transc., Tal.; West Siberia: Ob (southern part), U. Tob., Irt., Alt.; East Siberia: Yenisei (south-western part); Centr. Asia: Dzu.-Tarb., T. Sh., Pam.-Al. (Alai and Zeravshan ranges, very rarely in southern regions: found in Karategin and near Yakkabag). **Gen. distr.:** Centr. Eur., Bal.-As. Min. (northern part of Balkan Peninsula), Dzu.-Kash. (Kuldja area), Mong. Described from Hungary. Type in London.

Notes. 1) Up to the present time this species ("Viznanchnik rosl. URSR"; Hegi) is often presented under the name *N. nuda* L. which is not fully classified and is used in different meanings. Moreover, there is no doubt as to the appropriateness of the epithet *N. pannonica* L. and hence its substitution by the epithet *N. nuda* L., published at the same time, is at any rate superfluous. Linnaeus reported Spain as the homeland of *N. nuda* L., which has now been proven to be inaccurate. It is not clear if *N. nuda* Jacq. (Fl. Austr. I, 1773, tab. 24) corresponds to Linnaeus' *N. nuda*. The problem of identity or specific distinctiveness of *N. nuda* L. and *N. pannonica* L. has been the subject of a number of specialized studies. Summing up the views of Bauer, Janchen and Kerner, Freyn concluded, in agreement with these authors, that *N. nuda* L., a species distinct from *N. pannonica* L., is distributed in more southern parts of Europe (Albania, south of the Balkan Peninsula). Hayek considers *N. nuda* L. to be a white-flowered form of *N. pannonica* L.; it is possible that *N. nuda* Jacq. corresponds to this interpretation. The form described as *N. nuda* var. *albiflora* Boiss. from Asia Minor differs from the white-flowered form of the original *N. pannonica* in the more compact many-flowered cymes and broader calyx-teeth. The white-flowered form occurring in Western Transcaucasia (Abkhazia) resembles the Southwest Asian form and requires further investigation as do the other Transcaucasian forms (especially those from Talysh) among which specific, geographical races may be separated upon detailed field study.

2) With respect to *N. turkestanica* Gandoger (type from Tarka River near Kuldja), we were unable to find any consistent differences from *N. pannonica* L.

3) Investigation of the type specimen of the enigmatic species *N. barbata* Regel et Winkl., grown in the Pomologicheskii garden in Peterburg from seeds collected in Dzhungaria, revealed that it does not essentially differ from *N. pannonica* and represents a form of this species deviating slightly in leaf shape, which is apparently due to growing in the shade.

4) A hybrid *N. pannonica* × *N. strictifolia* was discovered in the Nakhichevan ASSR (Karagut massif). The plant was a female specimen that closely resembled *N. pannonica* in the structure of the corolla as well as in the character of branching and shape of the inflorescence, but differed conspicuously from this species in the shape of the calyx

(narrowly tubular, curved in front), with teeth intermediate in shape between those of the two above-named species; shape and dentation of cauline and floral leaves and bracts, as well as indument, are very similar to those of *N. strictifolia*; corolla whitish, with violet-blue limb.

Economic importance. The aerial part of the plant yields oil, the output ranging from 0.09 (Kudryashev, 1934) to 0.15–7.28% (Prokhorov and Lebedev, 1932). The oil is pale yellow, mobile, and has an unpleasant odor; it is not soluble in alcohol and hence its importance in the perfume industry is negligible. A nectariferous plant.

Cycle 1. *Sulphureae* Pojark. — Corolla yellow or cream-colored; nutlets without hairs at apex.

In addition to the 3 species occurring in the Soviet Union, this cycle contains *N. media* Stapf (NE. Iran, Alwand mountains) and *N. marrubioides* Boiss. et Heldr. (Asia Minor).

68. *N. sulphurea* C. Koch in Linnaea, XXI (1848) 677. — *N. pontica* C. Koch, l. c. — *N. nuda* β . *albiflora* Boiss. Fl. or. IV (1879) 663, p. p. — *N. nawaschini* Bordz. in Protok. zased. Kievsk. obshch. estestvoisp. (1907) XXXIV; idem, in Zap. Kievsk. obshch. estestvoisp. XXV, 1, 109; Grossg. Fl. Kavk. III, 292 (excl. pl. Lenkor.); idem, Opred. rast. Kavk. 330.

Perennial; root woody, thickening above; stems numerous, to 1 m long, erect, sturdy, 410 to 5 mm across, scabrous, with very short antrorse hairs (these rather dense in upper part and mostly very sparse below), simple or branching; branches firm, usually short (only the lowermost to 15–20 cm long), with numerous subremote pairs of cymes; middle internodes 3.5–7 mm long, usually shorter than leaves; cauline leaves short-petioled, the upper sessile (only the lowermost with petioles 8–15 mm long), oblong-ovate or oblong to sub-lanceolate, to 7–8.5 mm long, 2.5–3.5 mm wide, from cordate to orbicular or nearly cuneate at base, mostly obtuse at apex, crenate or dentate, light green, paler beneath, scaberrulous on both sides with very short hairs, the upper side with sparse appressed hairs, the lower side more densely hairy and beset with numerous punctate glands and with prominent coarse veins; lower floral leaves sometimes resembling the upper cauline, dentate, about equaling the cymes, the others bracteiform, narrowly lanceolate or linear-lanceolate, entire, slightly exceeding peduncles; cymes gathered in long narrow racemes at ends of stem and of axillary branches, forming in aggregate a rather contracted narrow panicle; pairs of cymes, except sometimes the upper, distinctly remote; all cymes (even the upper) many-flowered, many of them once or twice dichotomously branching, the axes thick, large, densely covered with short spreading hairs; peduncles of upper cymes 2–4 mm, the lower 8–10 mm long; bracts pale green, with scarious colorless margin, shorter than calyx-tube; pedicels ca. 0.3 mm long, thick; calyx 5.5–7 mm long, pale green, densely covered with very short spreading hairs, the throat slightly oblique; teeth subequal, lanceolate- or linear-oblong, with green nerve and broad white margins, as long as or slightly shorter than tube; corolla white, sometimes with few lilac speckles on the yellow lower lip, hairy outside, the hairs very short, longer only on the lips, in bisexual flowers 8–10 mm long; tube with neck included in calyx nearly to middle; upper lip 2.5–3 mm long, cut to the middle into ovate apically attenuate lobes; middle lobe of lower lip with a beard of long hairs at

base, 2.5–3 cm long, 4–5.5 mm wide, the lateral lobes triangular, 1.2–1.5 mm long, 2–2.8 mm wide; upper stamens as long as or slightly shorter than upper lip of corolla; style slightly exserted; corolla of pistillate flowers smaller, 7–8 mm long, included up to the limb, the middle lobe of lower lip relatively less developed; staminodes included in the dilated part of tube, with very small scarious rudiments of anthers; style long-exserted, curved, with large lobes 1 mm long; nutlets 2–2.5 mm long, 1–1.2 mm wide, 3-angled, 411 ellipsoid, brown, becoming almost black, finely and obtusely tuberculate on both sides, with acute, tightly crowded tubercles near apex, but not hairy. Fl. second half of June to July; fr. second half of July to August.

Subalpine and central mountain belts, meadow slopes and forest margins. — Caucasus: S. Transc. and Tal. **Gen. distr.:** Bal.-As. Min. (northeastern part of Asia Minor) and Arm.-Kurd. (western part). Described from Gemshin at upper reaches of Fortuna River on Pontus Range. Type was in Berlin.

69. *N. sintenisii* Bornm. in Fedde, Repert. sp. nov. X (1912) 421; O. and B. Fedch. Perech. rast. Turk. V, 145.

Perennial; root woody, dense, oblique, 2.5–3 mm across, passing at apex into branching rhizome; stems erect, sturdy, 4.5–6.5 cm long (and probably longer), 3–6 mm across, densely leafy (leaves being longer than internodes), above middle with (2) 4–6 axillary fertile branches 6–20 cm long, sometimes with few short slender sterile branches in lower part, grayish tomentose or almost arachnoid, the hairs fine, implexed, jointed, viscid, dense on upper part of stem especially beneath inflorescence and persistent, rather early disappearing in lower part; cauline leaves sessile (only the lower with petioles 5–8 mm long), 5–8 (9) cm long, 2–2.5 (3.5) cm wide, lanceolate, rarely ovate-oblong, cordate or subhastate (the upper sometimes cuneate) at base, gradually attenuate above, obtuse or acute at apex, evenly crenate-dentate, covered on both sides with gray implexed fine jointed viscid hairs and rather numerous round yellow resinous sessile glands; leaves of sterile stems and of axillary sterile shoots usually wider, the lower petioled; verticillasters compact but few-flowered (6–12 flowers), the upper closely approximate, short-peduncled, the lower 1–4 more or less remote and on longer peduncles (3–8 mm); lower floral leaves resembling the cauline, decreasing in size toward summit of inflorescence, becoming narrower (to linear-lanceolate) and progressively less toothed, the upper bracteiform, narrowly linear, bracts narrowly linear, 0.2–0.4 mm wide, half as long as calyx or rarely longer; pedicels 0.4–1.5 (2) mm long; calyx 7–8 mm long, 1.5–2 mm wide, cylindrical, becoming subobovoid in fruit; teeth nearly subulate, equal in length, as long as calyx-tube or slightly longer; calyx and bracts densely white-villous, with fine jointed hairs and densely covered with short whitish capitate glandular hairs and yellow sessile glands; corolla of bisexual flowers 10–12 mm long (female ca. 8 mm long) pale yellow, with more intensely colored 412 lower lip, hairy outside; tube not exserted; upper lip 2–2.5 mm long, cut to 1/3 into 2 obtuse lobes; middle lobe of lower lip 2.25–3 mm long, 4–5 mm wide, coarsely crenate-incised, bearded at base, the lateral lobes nearly suborbicular, 1–1.5 mm long, 2–2.5 mm wide; upper stamens equaling upper lip, the lower half as long; anther-cells at first markedly convergent, later divergent at an angle of nearly 180°; style as long as upper lip; nutlets blackish-brown, bearded, broadly ellipsoid, 2–2.3 mm long, 1.25 mm wide. Fl. second half of May to July; fr. from end of June. (Plate XXIV, Figure 1.)

Steppe plant communities in central mountain and subalpine belts. — Centr. Asia: Mtn. Turkm. (Kopet Dagh Range, western part). **Gen. distr.:** Iran. (N. Iran: Sammam mountains in Gilyan). Described from Sundzodag Mountain in W. Kopet Dagh. Duplicate of type in Leningrad.

70. **N. komarovii** E. Busch in Bot. zhurn. SSSR, XXIV (1939) 423; Grossg. Oprod. rast. Kavk. 331; Sosnovsk. Fl. Gruz. VII, 301. — **lc.:** E. Bush, op. cit. tabl.

Perennial; root oblique, tough, woody; stems to 110 cm long, 3.5–5 mm across, sharply 4-angled; slightly flexuous, in lower part usually glabrous, in upper part, especially below inflorescence, densely covered with very small (magnifying glass!) simple spreading hairs, in lower part with sterile, sometimes very short branches, above with 1 or 2 pairs of long fertile branches, the internodes usually slightly exceeding leaves; lower leaves brown, squamiform, other cauline leaves with stout petioles about 1/10 as long as blade, thin (dry — chartaceous), pale green, sparsely covered on both sides with very short simple hairs and with numerous punctate glands beneath, lanceolate, deeply cordate at base, obtuse at apex, evenly crenate or crenate-dentate along the whole margin, 5.5–8 cm long, 2.7–3 cm wide; lower floral leaves resembling the cauline but at most half as long, decreasing in size and progressively less toothed toward summit of inflorescence, mostly bracteiform, narrowly linear, 5–10 mm long, 0.7–1.5 mm wide; upper cymes dense, 5–8-flowered, subsessile, forming compact verticillasters, the lower with up to 17 flowers, on peduncles 5–12 (20) mm long, inflorescence on stem consisting of 10 pairs of cymes, 4–7 cm apart in lower part, 1–2 cm apart above; axillary branches with 5–10 pairs of few-flowered cymes; bracts narrowly linear, 3.5–5 mm long, much shorter than calyx, acuminate; pedicels 1–1.5 mm long; calyx 8–10 mm long, pale green, the nerves densely covered with short
413 spreading simple hairs; throat slightly oblique; teeth with ciliolate scarious margin, as long as tube, the upper 4–5 mm long, the lower slightly shorter; corolla cream-colored, with pale yellow lower lip, 12.5–16 mm long, pubescent outside, included to base of neck; tube expanding into neck 3–4 mm long and as wide; upper lip 3.5–4.2 mm long, cut to middle into obtuse ovate lobes; lower lip with middle lobe 3–4 mm long and 5–6 mm wide, the obliquely triangular-semiorbicular lateral lobes 1.2–1.6 mm long and 2.7–3 mm wide; nutlets brown, ellipsoid, slightly enlarged below, obtuse at both ends, 3-angled, finely and acutely tuberculate. Fl. and fr. end of July.

Subalpine belt, on rocks. — Caucasus: southern slope of Main Range. Endemic. Described from S. Osetia — vicinity of Styr Gnukh village in basin of Malaya Liakhva River. Thus far only known from two locations near the above-mentioned village. Type in Leningrad.

Section 9. **Oxynepet**a Benth. Lab. gen. et sp. (1834) 467 (excl. sp. 58–59); Boiss. Fl. or. IV, 639; Briq. in Pflanzenfam. IV, 3a, 238. — **Oxynepet**a Bge. Lab. Pers. (1873) 58 (pro gen.). — Plants dioecious (or partly polygamodioecious?); flowers of two types: pistillate, the long style with large outwardly curved lobes and staminodes included in dilated part of corolla-tube; staminate, the normal stamens under upper lip and style shorter than stamens, lobes of stigma rudimentary, not divergent; individuals with such flowers usually sterile, but sometimes certain flowers (bisexual?) set fruits; calyx erect,

more or less cylindrical in flower; throat suberect; teeth lanceolate-subulate, aristate, covered inside and at margin of sinuses with coarse antrorse hairs; corolla completely included in calyx, with straight tube; upper lip 2/7-1/3 as long as the lower, with orbicular lobes; lateral lobes of lower lip erect, obliquely semiorbicular, the middle lobe upright, tapering to a short broad claw, concave, with large-toothed margin; nutlets finely punctate and covered with small flat tubercles; flowers in cymes, forming small pyramidal panicles at ends of stem and of pyramidally disposed axillary branches; central flower of cyme sessile. Perennial plants.

The section includes slightly more than ten species, most of them distributed in Southwest Asia, including the Caucasus.

Note. Species of this taxonomic group are erroneously characterized by Bunge and all later authors as gynodioecious, the central flower of each cyme supposedly being bisexual, the peripheral flowers imperfectly male. Examination of the enormous amount of herbarium material does not confirm this: the presence of dioecism is unquestionable (at least in all our species).

Series 1. *Parviflorae* Pojark. — Flowers azure or blue.

In addition to the species occurring in the USSR, this series also contains *N. heliotropifolia* Lam.s.l. (NE Asia Minor), *N. curvidens* Boiss. (S. and C. Asia Minor, in the north to Cappadocia inclusive), *N. callichroa* Hausskn. et Briq. (Iran) and *N. hispanica* Boiss. (Spain).

71. *N. parviflora* M. B. Fl. taur.-cauc. II (1808) 41; Benth. Lab. gen. et sp. 486, in DC. Prodr. XII, 393, p. p.; Ldb. Fl. Ross. III, 380, p. p. (excl. pl. talysch.); Fl. Yugo-vost. VI, 144; Grossg. Opred. rast. Kavk. 330, p. p. — *N. ucrainica* auct.: Boiss. Fl. or. IV (1879) 668, p. p. (quoad pl. taur. et cauc. excl. pl. talysch.); Shmal'g. Fl. II, 324; Fedch. and Fl. Fl. Evrop. Ross. 808; Grossg. Fl. Kavk. III, 292, p. p. — *N. euxina* Velen. Fl. Bulg. Suppl. I (1892) 232; Hayek, Prodr. fl. Balcan. 263. — Exc.: Callier, Iter taur. a. 1900, No. 703.

Perennial; root woody, tough, more or less twisted, passing into a short rhizome; stems 18-70 cm long, erect or somewhat ascending, densely villous the whole length or only below inflorescence with long white many-jointed simple (not glandular or viscid) hairs, in upper part usually with short crisp pubescence, strongly branching, the branches long, gradually shorter toward summit, fertile, usually branching in turn; leaves bright green or glaucous, firm, the main veins impressed above, prominent beneath, the upper side with sparse appressed hairs, the lower side mostly rather densely covered with long spreading hairs, rarely the hairs sparse or shorter; cauline leaves to 5-6.5 cm long, to 2-3 cm wide, ovate or lanceolate-ovate, the upper often lanceolate, gradually narrower toward summit, cordate or the upper rounded or cuneate at base, usually obtuse at apex, the margin serrate-dentate or crenate-dentate; petioles villous or pubescent, the upper short, the lower long, sometimes longer than blade; floral leaves mostly exceeding peduncles, the lower resembling upper cauline leaves, the upper bracteiform; bracts sessile, narrowly lanceolate, long-acuminate, entire, much longer than axes of cymes; cymes 3-5 pairs, on peduncles 3-7 mm (the upper) to 3-4 cm long, mostly twice or thrice dichotomously branching but compact; axes of cymes 3-7 mm long in flower (8-9 mm in fruit); calyx 6-7.5 (8) mm

long, usually green (like the bracts), rarely bluish, densely covered with crisp short or
415 (especially in lower part long, white hairs; tube in flower cylindric-obconical, in fruit 3–
4.5 mm long and as wide, subglobose or rounded-ovoid; teeth often shorter than tube,
rarely as long, very rarely slightly longer, lanceolate-subulate; corolla 7.5–8.5 (9) mm long,
blue-azure, as long as calyx; middle lobe of lower lip reniform, ca. 1.5 mm long, 2.5 mm
wide; in staminate flowers stamens slightly shorter than upper lip, style usually scarcely
reaching the base of stamens, rarely almost as long as lower stamens; in pistillate flowers
style equaling or slightly exceeding the upper lip of corolla, staminodes with distinct fila-
ments and round scarious rudiments of anthers; nutlets 2–2.5 mm long, 1.4–1.6 mm wide,
dark brown, ellipsoid, truncate at both ends, indistinctly and remotely finely tuberculate,
usually covered at the top with thick hairs. Fl. second half of May to July; fr. from June.

Steppe plants, also occurring on wastelands, chalky slopes, seldom among crops. —
European part: M. Dnp., V.-Don (southwestern part), Transv. (western part, rarely), U.
Dns., Bes., Bl., Crim. (Simferopol', Karasu-Bazar, Sudak, rarely), L. Don, L.V. (western
part, rarely). **Gen. distr.:** Centr. Eur. (reported by Kerner for Central Hungary), Bal.-As.
Min., Rumania (Dobrudja) and (according to Hayek) Bulgaria. Described from material
from the Crimea and N. Caucasus. Type (lectotype) in Leningrad.

72. *N. ucrainica* L. Sp. pl. (1753) 570; Bge. in Ldb. Fl. Alt. II, 403; Benth. Lab. gen.
et sp. 487; in DC. Prodr. XII, 393 (excl. pl. taur.-cauc.); Ldb. Fl. Ross. III, 381 (excl. pl.
taur.-cauc.); Fl. Yugo-vost. VI, 144; O. and B. Fedch. Perech. rast. Turk. V, 148, p. p.;
Kryl. Fl. Zap. Sib. IX, 2310. — *N. sibirica* Bge. in Ldb. Fl. Alt. II (1830) 402 (cum auct.
M.B.) non L. — *Teucrium sibiricum* L. l. c. 564; Pall. Reise Russ. R. II, 269, III, 314;
Georgi, Beschr. Russ. R. III, 5, 1077. — **lc.:** Rchb. Ic. Fl. Germ. tab. 1243, fig. II.

Perennial; root woody, tough, branching; rhizome thickened, multicapital, sometimes
branching; stems 17–50 cm long, erect or slightly ascending, subglabrous or covered with
short simple upcurved hairs, sometimes with admixture of long white hairs on the ribs,
pyramidally branching; leaves shorter than internodes, pale green, more or less pellucid,
the upper side glabrous or with sparse short appressed hairs, the lower side hairy only on the
somewhat prominent veins to (rarely) densely covered with short or sometimes longer,
more or less spreading simple hairs; cauline leaves 2–4.5 cm long, 1–2.5 cm wide, ovate to
lanceolate, the upper to narrowly lanceolate, with cordate or cuneate base, shortly or gra-
dually tapering above, the upper attenuate, with acute or rarely obtuse tip, dentate or ser-
416 rate, the uppermost sometimes entire; lower petioles as long as blade, the upper short;
bracts, except sometimes the lower, longer than peduncles at flowering, as long or shorter
in fruit, lanceolate, mostly long-acuminate, sessile, all entire except sometimes the lower;
cymes at summit of stem 5–7 (8) pairs, fewer on axillary branches, on peduncles 0.5–
1.5 cm (the upper) to 4–5 cm long, mostly simple, 3-flowered, the lower partly twice
(thrice) loosely dichotomously branching, with axes of first order 0.5–0.8 mm long in flower,
1–2 cm in fruit; bracts mostly shorter than calyx, rarely as long; pedicels 3.5 mm long,
twice as long in fruit; calyx 9–12 (13) mm long (violet?) blue, densely covered, especially
in lower part, with usually long spreading simple white hairs, in upper part (at times
nearly all over) with sparser short crisp hairs sometimes intermixed with glandular hairs,
narrowly cylindrical in flower, becoming oblong-obconical, expanding in fruit (2.5–3 mm
wide), cylindrical or ovoid-cylindrical, 2½–3 times as long as wide; teeth usually shorter
than tube or just as long, rarely slightly longer; corolla 9–12 mm long, blue, as long as

calyx; upper lip cleft nearly to base; lateral lobes [presumably of lower lip] slightly shorter than upper lip, the middle lobe reniform, 2-3 mm long, 3-5 mm wide; in staminate flowers upper stamens shorter than upper lip, style as in preceding species; in pistillate flowers style as long as upper lip of corolla, with large downcurved lobes 1-1.2 mm long; staminodes concealed in upper part of tube, with very short filaments and very small round rudiments of anthers; nutlets 2.5-2.7 mm long, 1.8-1.9 mm thick, ellipsoid, rounded-truncate at both ends, blackish-brown in maturity, rather densely tuberculate, the tubercles small, very flat, sometimes more convex near apex, acute. Fl. May-June; fr. second half of June to July.

Plains and mountain steppes and meadows, exposed gravelly and stony slopes. — European part: V.-Kama (far north), Transv., L. Don (eastern part), L.V.; West Siberia: U. Tob., Irt.; Centr. Asia: Ar.-Casp. (far northern part), Dzu-Tarb., T. Sh., Pam.-Al. (Alai and Transalai ranges). **Gen. distr.:** Centr. Eur. (N. Rumania, Hungary, very rarely), Bal.-As. Min. (reported for Dobrudja and Bulgaria by Hayek). Described from the "Ukraine" (in actual fact, from the southeastern European part of the USSR, apparently). Type in London.

Notes. 1) *N. ucrainica* L. has been identified with *N. parviflora* M.B. by many of the earlier (as well as contemporary) authors. Bentham (1834), on the strength of examination of the Linnaean specimens, established the fallacy of such an interpretation of *N. ucrainica* L. He pointed out that this species was identical with *Teucrium sibiricum* 417 L. and that *N. parviflora* M.B. was a separate species which he interpreted in the same way as Bieberstein. *N. ucrainica* L. (in Bentham's interpretation) and *N. parviflora* M.B. are so markedly different from each other that it is difficult to imagine that Bentham, who distinguished them so well, could have been mistaken as to the identity of Linnaeus' specimens. We take it that in this case we can fully rely on the authority of Bentham. In the European part of the USSR, the westernmost habitat of *N. ucrainica* is fixed by a herbarium specimen from the village of Mikhailovka on the Medveditsa River (tributary of the Don); the species is quite common on the right bank of the Lower Volga. It is noteworthy that the only reference cited by Linnaeus in his description of *N. ucrainica* was Herbert's list (1743) of plants from the Don and Volga. *N. ucrainica* is unknown outside the Ukraine. However, it has long been claimed for Transylvania and it is reported at present for Dobrudja and Bulgaria. It is possible that it occurs in Moldavia and Podolia. May not the *N. campestris* Andr. (Izv. Kievsk. univ. 7, 1862, 126, non Benth.), described from Podolia, be *N. ucrainica* L.?

2) In the scope adopted here, *N. ucrainica* is not wholly monotypic and represents a series of minor forms. In order to obtain an evaluation of their taxonomic significance, there is need of more material and field observations. A catmint of the Alai and Transalai ranges, recalling *N. kopetdaghensis* in some characters, deserves special attention.

73. *N. schischkinii* Pojark. in Addenda XIX, 358. — *N. heliotropiifolia* Ldb. Fl. Ross. III, 1 (1847-1849) 381, non Lam. — *N. parviflora* auct.: Benth. in DC. Prodr. XII (1848) 393; Grossg. Opređ. rast. Kavk. 330, p. p. quoad pl. talysch. — *N. ucrainica* auct.: C.A. M. Verzeichn. Pfl. Cauc. kasp. Meer. (1831) 92; Boiss. Fl. or. IV, 668, p. p.; Grossg. Fl. Kavk. III, 292, p. p., quoad pl. talysch. non M.B.

Perennial; root tough, woody, branching; stems 30-60 cm long, 3-5 mm across, ascending, acutely 4-angled, scabrous, with dense, very short, simple, spreading, more or less

reclinate, proximally thickened hairs, finally glabrescent at base, simple or with leafy sterile branches in lower part, with 3–5 pairs of long fertile branches above, these 2.5–4.5 (5.2) cm long, 0.8–2.4 (3.2) cm wide, sometimes branching in turn; leaves yellowish-green, rather firm, with veins impressed above and prominent beneath, covered on both sides with spreading curved or nearly crisp hairs, these longer than on stem, usually sparse on the upper side, much more copious beneath, especially on the veins; lower and middle cauline leaves approximately as long as internodes, rarely longer or shorter, with petioles 2/3 (the lower) to 1/3 as long as blade, broad-ovate to ovate, truncate or cuneate or rarely cordate at base, obtuse at apex, the margin coarsely crenate or obtusely dentate; upper leaves much shorter than internodes, with petioles 2.5–6 mm long, oblong-ovate, rarely lanceolate, with cuneate base, gradually attenuate to obtuse or acute apex, toothed from base or only in upper part, usually entire near apex; floral leaves at flowering greatly exceeding, later as long as or slightly shorter than peduncles, oblong or lanceolate, long-acuminate, entire, decreasing in size toward summit of inflorescence, becoming narrower, bracteiform; cymes 4–7 (9) pairs on stem, with peduncles 0.5–1 (the upper) to 4 cm long, the upper simple, 3-flowered, the lower twice or thrice loosely dichotomously branching, with axes of first order 5–8 mm long (in flower), later 12–20 mm long; lateral flowers of cymes on pedicels 1.5–4 mm, finally to 8–10 mm long; calyx in flower narrow, tubular-cylindrical, (8) 9–11 mm long, in fruit with ovoid-cylindrical tube, more or less suffused with violet, densely covered with thick crisp hairs; teeth linear-subulate, very long-aristate, usually slightly longer than tube; corolla 6.5–9 mm long, shorter than calyx (calyx-teeth exceeding it by 1.5–2 mm), only in male flowers sometimes as long as calyx, blue, appressed-hirsute outside; upper lip 1–2 mm long, cut to the middle; lateral lobes of lower lip 0.7–1.2 mm long, 1.5–2 mm wide, the middle lobe flabelliform, 2–3 mm long, 4.5–5 mm wide; in male flowers upper stamens as long as upper lip of corolla, style reaching base of filaments, the lobes not divergent; in pistillate flowers style exceeding corolla by 1.5–2 mm, staminodes with very small round scarious rudiments of anthers and often with very short filaments; nutlets broadly ellipsoid, 2–2.2 mm long, 0.7–0.8 mm wide, truncate at both ends, dark brown, finely tuberculate on both sides, the tubercles obtuse, near apex more numerous and sometimes more convex or even acute. Fl. June to first half of July; fr. second half of July to September.

Steppe and meadow slopes in central mountain belt. — Caucasus: E. Transc. (near Shemakha and southwestern part of Azerbaidzhan), S. Transc., Tal. **Gen. distr.:** may possibly occur in neighboring parts of Iran. Described from ravine Pir-Seid on Bozdag Mountain in southwestern Azerbaidzhan. Type in Leningrad.

74. *N. kopetdaghensis* Pojark. in Addenda XIX, 359. — *N. ucrainica* α *grandiflora* 419 f. *subsimplex* et β . *parviflora* f. *pubescens* O. Ktze. in Tr. Bot. sada, X (1887) 228. — *N. ucrainica* auct. fl. turkest.: O. and B. Fedch. Perech. rast. Turk. V (1913) 148, p. p. quoad pl. turcom. — Exs.: Sintenis, It. transcasp.-pers. a. 1900–1901, No. 185.

Perennial, densely leafy, with woody, tough, often twisted, branching root and short rhizome; stems 25–65 cm long, to 5 (6) mm thick, sharply 4-angled, more or less densely covered with short crisp hairs interspersed, mainly along ribs, with very fine long many-jointed, arachnoid-implexed pellucid lustrous viscid hairs (these often very copious in lower part), unbranched below or developing short sterile branches, higher (rarely nearly

from base) with 5-8 pairs of leafy fertile branches, these sometimes in turn branching in lower part; leaves yellowish-green, thin, the veins (except the main) usually thin beneath, distinct but not prominent, impressed above; the lower side mostly densely covered with fine spreading pellucid viscid hairs (these shorter than on stem), the upper side usually with sparse appressed hairs (the upper leaves usually densely pubescent on both sides), the margins finely ciliate; cauline leaves to 4.5-5.5 cm long, 2.2-2.5 (3) cm wide, the lower oblong-ovate, with cordate or truncate base, obtuse, crenate, the others lanceolate, gradually attenuate from cuneate base to an obtuse tip, the margin with subremote antrorse or spreading teeth; petioles puberulent, the lower ca. 2/3 as long as blade, often arachnoid-villous, the upper short; uppermost leaves sessile; lower floral leaves lanceolate, dentate, the upper entire, at flowering longer than peduncles, later as long or slightly shorter; cymes 3-4 pairs on stem, with peduncles 5-12 mm long (the upper) and to 4.5-5 cm (the lower), often simple, 3-flowered, some of the lower with 8 (10) flowers, twice (thrice) loosely dichotomously branching, the axes of first order 5-10 mm long, later nearly twice as long; lateral flowers of cymes on pedicels 2-5 mm long, in fruit to 10-13 mm long; calyx in flower cylindric-obconical, 9-11 mm long, in fruit ovoid, violet; tube tomentose, with long fine spreading white hairs; teeth usually slightly longer than tube, lanceolate at base, long-acuminate, sparsely covered with very long hairs; corolla 8.5-11 mm long, usually equaling or slightly shorter than calyx (only in staminate flowers sometimes exceeding calyx-teeth), dark blue, puberulous outside; upper lip 1.5-2 mm long, deeply cleft; 420 lateral lobes of lower lip 1 mm long, 1.5-1.8 mm wide, the middle lobe flabelliform; in staminate flowers upper stamens 1/2 to 2/3 as long as upper lip of corolla, style hardly reaching the base of upper stamens, with short rudimentary connivent lobes; in pistillate flowers style not exerted from corolla, staminodes with very short filaments and very small round scarious rudiments of anthers; nutlets broad, ellipsoid-obovoid, 2.8 mm long, 1.8 mm wide, brown, obscurely tuberculate on both sides. Fl. May-June; fr. from first half of June.

Steppe and meadow coenoses from foothills to subalpine belt. — Centr. Asia: Mtn. Turkm. (C. Kopet Dag). Endemic. Described from Kopet Dag, mountains above Nef-ton village near Ashkhabad. Type in Leningrad.

Series 2. *Erivanenses* Pojark. — Flowers yellow or reddish.

In addition to the Soviet species, this series should contain *N. involucrata* Bge. (N. Iran) and *N. cryptantha* Boiss. et Hausskn. (N. Syria and Mesopotamia).

75. *N. erivanensis* Grossh. in Beih. Bot. Centralbl. XLIV (1928) 234; Fl. Kavk. III, 291; Opred. rast. Kavk. 292.

Perennial; stems many, 30-70 cm long, densely covered with short simple and capitate glandular hairs, sometimes interspersed with solitary long jointed hairs; upper part of stem, axillary branches and petioles with glandular hairs only; branches often arising nearly from base of stem, rarely from its middle, nearly all fertile; leaves yellowish, light green, dull, thin, with thin but prominent veins, 2-3.5 cm long, 1-2.2 cm wide, all ovate or the upper oblong-ovate, with cordate or (mainly the upper) rounded-cuneate base, obtuse at apex, crenate or crenate-dentate, the uppermost sometimes entire; lower petioles

2/3 as long as blade, the upper short; lower floral leaves resembling cauline leaves, the others lanceolate or oblong, often entire, acuminate; cymes on stems 5-6 pairs, the lower with peduncles to 4-5 cm long, 3-4 cm apart, the upper with peduncles 0.6-1 cm long, approximate; many cymes twice (the lower thrice) dichotomously branching, only the upper simple, 3-flowered, all dense, short, the axes being 5-6 mm long, the pedicels 1-4 mm long, scarcely elongating after flowering; bracts oblong or lanceolate-linear, aristate-acuminate, as long as calyx or shorter; calyx 5-7.5 mm long, pale green, densely covered along the ribbed nerves with short thick antrorse hairs intermixed to varying extent with
 421 short-stipitate capitate pellucid glands, cylindrical in flower, with broadly ovoid tube; teeth mostly exceeding, sometimes up to half as long again, rarely as long as calyx, lanceolate-subulate, the margin with short simple and glandular cilia; corolla yellow, puberulent outside, 6-8 mm long; upper lip 1.2-1.5 mm long, deeply cut into ovate lobes; lateral lobes of lower lip nearly as long as lobes of upper lip, the middle lobe with a very short claw, the margin of the reniform limb with few large teeth; in staminate flowers upper stamens nearly as long as upper lip of corolla, style merely reaching the base of filaments, the rudimentary lobes connivent; in pistillate flowers style slightly exceeding the upper lip of corolla, with recurved lobes 0.8-1 mm long, staminodes with rather large round scarious rudiments of anthers and short filaments; nutlets broadly ellipsoid, truncate at ends, 2-2.5 mm long, 1.3-1.5 mm wide, sparsely tuberculate, the tubercles large but flat, at apex numerous, small, more convex. Fl. May-June; fr. from end of May. (Plate XXIV, Figure 2.)

Taluses, stony and rocky slopes in lower mountain belt. — Caucasus: S. Transc. (southern part of Armenia and Nakhichevan ASSR). Endemic. Described from vicinity of Erevan. Type in Tbilisi?

Section 10. **Micronepeta** Benth. in DC. Prodr. XII (1848) 394; Boiss. Fl. or. IV, 639, p. p. (pro subsect.); Briq. in Pflanzenfam. IV, 3a, 238, p. p. (pro subsect.). — Calyx cylindrical (in fruit accrescent, usually ovoid or campanulate), straight with straight throat; teeth erect, covered, especially inside, at base and at margin of sinuses, with long stiff antrorse hairs, these forming a fringe at margin of throat; corolla small (5-9 mm long), included mostly to limb, rarely to base of dilated part of tube; middle lobe of lower lip erect, with swelling at base; nutlets smooth, shining. Flowers in verticillasters or cymes, the upper mostly crowded in a head, rarely all remote; floral leaves usually large, longer than inflorescence. Annual plants.

Species of this section occur mainly in Iran, also in Central Asia and Afghanistan.

Series 1. *Bracteatae* Pojark. — Verticillasters forming a terminal capitate inflorescence, sometimes 1 (very rarely 2) verticillaster remote; floral leaves of semiverticels large, ovate to lanceolate-linear, nerved, not spiny, tapering to short petiole, usually forming together with terminal floral leaves a kind of involucre around the head (and axillary
 422 semiverticels); calyx narrowly cylindrical in flower, slightly broader in fruit, the lanceolate-subulate teeth separated by broad sinuses; upper lip of corolla deeply cut into oblong-ovate lobes; middle lobe of lower lip tapering to a short broad claw, entire, with concave lobes. Plants of subalpine belt and Central Asian juniper belt.

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PLATE XXIV. 1 – *Nepeta sintenisii* Bornm., summit of plant, bisexual flower, expanded corolla of pistillate flower, fruiting calyx, nutlet; 2 – *N. erivanensis* Grossh., summit of plant, staminate flower, expanded corolla of staminate flower, expanded corolla of pistillate flower, nutlet.

In addition to two species distributed through Central Asia, Iran and Afghanistan, this series also contains *N. globiflora* Bge. which is endemic to Iran.

76. *N. bracteata* Benth. in DC. Prodr. XII (1848) 395; Boiss. Fl. or. IV, 666; Lipsk. in Tr. Bot. sada, XVIII, 69; O. and B. Fedch. Perech. rast. Turk. V, 147. — *Zataria ? humilis* Benth. l. c. 183. — Exs.: Kotschy, Pl. Pers bor. No. 179.

Annual, 5–25 cm high, usually divaricately branching from base, with decumbent lower branches; only weak, small plants unbranched; stem and branches stiff, violet, covered with very short white curved proximally thickened hairs forming a glaucescent bloom; branches long, often equaling the stem, terminating in inflorescence, often bearing short sterile axillary branchlets; cauline leaves with petiole about the length of blade, ovate or rhombic-ovate (the upper often sub lanceolate), 9–16 mm long, 5.5–12 mm wide, truncate rounded or cuneate at base, obtuse or acute, entire or often with 3–5 large acute remote teeth on each margin, rather densely covered on both sides with white 2–3-jointed basally thickened hairs, the main veins rather thick, violet beneath; terminal leaves (subtending the head) short-petioled, resembling the upper cauline or those subtending verticillasters; inflorescence a terminal head formed by several closely crowded, few-flowered verticillasters; one lower pair of remote capitate short-peduncled semiverticels sometimes present; leaves subtending semiverticels usually ovate, rarely elliptic, short-petioled, entire, dense, strongly nerved, to 10 mm long, together with terminal leaves forming a kind of involucre; bracts linear-lanceolate, ciliate, usually longer than calyx (rarely slightly shorter), like leaves subtending cymes green or violet; pedicels 1.5–3 mm long; calyx cylindrical, in
425 flower 4.5–6.5 mm long, in fruit 7–9.5 mm long, with 15 prominent nerves, green or violet, covered outside, especially along nerves, with long spreading white hairs; teeth linear-subulate, as long as tube or $1\frac{1}{2}$ (2) times as long, separated by rounded sinuses, these like teeth covered within along the margin with upright bristly hairs; corolla subglabrous outside, 6–7.5 mm long, included to the limb; tube slightly curved, 3–4 mm long, abruptly expanding into elongate infundibular neck 2–2.8 mm long and 1.5–2 mm wide; upper lip 1.2–1.5 mm long; lower lip with tetragonal-orbicular subpatent lateral lobes 0.5–0.7 mm long and 0.7–1 mm wide, the middle lobe tapering at base to a short broad claw, its limb 1–1.5 mm long, 1.5–2 mm wide, rounded below, inflated from base along median line, shallowly emarginate, with entire upturned margins; upper stamens reaching only the middle of upper lip of corolla; lower stamens and style not longer than lateral lobes of lower lip; nutlets ellipsoid, 1.2–1.5 mm long, 0.6–0.7 mm wide, pale brown, with obtuse edge on ventral side, slightly depressed at dorsal side. Fl. from May–June; fr. from June. (Plate XXV, Figure 2.)

Stony slopes and taluses in Central Asian juniper belt and sheep's fescue steppe. — Centr. Asia: Pam.-Al. (Kugitang, Turkestan, Zeravshan, Darvaz range and W. Pamir). **Gen. distr.:** Iran. (Iran, Afghanistan and Baluchistan). Described from vicinity of Isfahan in Iran. Type in London. Duplicates of type in Leningrad.

77. *N. daënsensis* Boiss. Diagn. ser. 1, VII (1846) 53; ej. Fl. or. IV, 667; Benth. in DC. Prodr. XII, 395; Bge. Lab. Pers. 58; Lipsk. in Tr. Bot. sada, XVIII, 105; O. and B. Fedch. Perech. rast. Turk. V, 147. — Exs.: Kotschy, Pl. Pers. austr. No. 915^b.

Annual; plants 3–18 (25) cm high; stem slender, erect, usually with axillary branches

at all nodes, green or reddish-violet, with very fine farinaceous bloom of minute hairs, these mainly simple, thickened toward base, interspersed with glandular hairs, on upper part of stem and in inflorescence almost exclusively capitate-glandular; nodes 2-4 (5), very far (often 6-11 cm) apart; axillary branches spreading or erect, arched at base, parallel to stem, sometimes branching in turn, terminating in inflorescence; leaves intense green or dark bluish-green, reddish-violet beneath, rarely anthocyanin-colored on both sides, linear or lanceolate, often curved and conduplicate, gradually tapering to narrowly cuneate base, 6-8 mm long, 0.25-0.5 mm wide, obtuse or acute, entire or with few distant acute often subulate-linear teeth, with thin dense simple and glandular hairs, petioles nearly as long as blade; verticillasters few-flowered, the upper subsessile, crowded in dense spicate-capitate terminal inflorescence, 0.5-1.5 cm long and 0.6-1.7 cm wide; floral leaves subtending inflorescence closely approximate, usually resembling cauline leaves, petiolate, exceeding head width (often considerably so); leaves subtending verticillasters rather large, to 7 mm long, 3 mm wide, oblong-ovate to oblong or narrowly elliptic, the lower green, the upper violet, firm, thick-nerved, entire, acute or acuminate; below terminal inflorescence usually one pair of semiverticels (rarely 2), subapproximate or more often remote, short-peduncled; bracts narrowly lanceolate or narrowly elliptic, acuminate, with densely white-ciliate margin, as long as calyx-tube or slightly longer; pedicels 0.5-1.5 (3) mm long; calyx 4-5 mm long, violet, glandular outside and with sparse spreading simple basally thickened hairs on the nerves; teeth linear-subulate, $1/2-2/3$ times as long as tube, ciliate at margin, separated by rounded sinuses, with long upright bristles at margin and within; corolla 5.2-5.8 mm long, reddish (violet-pink?), sparsely hairy outside, the slender curved tube 3.2-3.6 mm long, included in calyx to base of abruptly expanding neck, this 1.2-1.3 mm long, 1.3-1.6 mm wide; upper lip erect, 0.8-1.1 mm long; lower lip with horizontally disposed (at a right angle to upper lip) tetragonal subpatent lateral lobes 0.3-0.4 mm long and 0.7-1 mm wide, the large middle lobe subvertical, tapering to short claw, its limb 0.7-0.8 mm long, 1.7-2.1 mm wide, rounded at base, emarginate at apex, inflated at center from base to middle, concave at sides, with upturned margins; upper stamens slightly shorter than upper lip of corolla; style equaling upper stamens; nutlets brown, ellipsoid, 1.2-1.3 mm long, 0.6-0.7 mm wide, with obtuse edge on ventral side, slightly concave on dorsal side. Fl. June-August; fr. from June.

Stony slopes in subalpine belt. — Centr. Asia: Pam.-Al. (Shugnan and central part of S. Pamir). **Gen. distr.:** Iran. Described from Kukh-Daena mountains in S. Iran. Type in Geneva; duplicates of type in Leningrad.

Series 2. *Spathuliferae* Pojark. — Flowers at summit of stem and of axillary branches forming a capitate inflorescence, 1 or 2 distant verticillasters usually present below it; leaves subtending verticillasters not spinescent, spatulate or lanceolate-spatulate, tapering to long petiole, forming with floral leaves a kind of involucre around head and axillary semiverticels; calyx cylindrical-campanulate, in fruit ovoid-campanulate, the teeth lanceolate-subulate, separated by rounded sinuses; upper lip of corolla deeply cut into oblong-ovate lobes; middle lobe of lower lip clawless, cordate, concave, entire. This series consists of one species native in the high-mountain region of Pamir and Hindu Kush.

78. *N. spathulifera* Benth. in DC Prodr. XII (1848) 380; Boiss. Fl. or. IV, 668; Lipsk. in Tr. Bot. sada, XVIII, 106; O. and B. Fedch. Perech. rast. Turk. V, 147. — *N. reniformis* Briq. in Bot. Tidskr. 28 (1908) 236. — *N. fallax* Briq. l. c. 237. — **lc.**: in Bot. Tidskr. 28 (1908) fig. 3.

Annual; root slender, flexuous; stems 5–20 cm long, violet, sparsely covered with short glandular hairs, loosely covered in upper part (and when young also below) with long flocculent arachnoid often fugacious white hairs, rarely simple, usually divaricately branching all the way up or only in lower part; branches arched-ascending, the lower decumbent at base, with inflorescence as developed as on stem; leaves semiorbicular or reniform, some ovate-rhombic, usually broader than long, with cordate or truncate or rarely cuneate base, rounded or obtuse apex, unevenly and remotely crenulate to entire, 5–12 mm long, 6–15 mm wide, usually more or less suffused with violet, both sides with loose tomentose-arachnoid hairs, these sometimes fugacious; petioles glandular hairy, about as long as blade; semiverticels sessile, (2) 3–(5)-flowered, 2 or 3 pairs at summit of stem (and branches) forming a 10–12-flowered capitate inflorescence 1.5–2 cm long and as wide; other 1 or 2 verticillasters remote; floral leaves scarcely differing from cauline leaves, long-petioled; leaves subtending verticillasters of the terminal head, especially the lower, more or less foliaceous, spatulate or lanceolate-spatulate, forming together with terminal leaves a kind of involucre; semiverticels sometimes replaced by short (3) 5-flowered bostryces with numerous narrow bracts and then heads more compact, with more numerous flowers and with less distinct “involucre”; bracts petiolate, spatulate-ovate, to sessile, narrowly oblanceolate, acuminate, usually terminating in a rigid point, loosely covered
428 outside with long implexed white hairs, often glandular, especially at base and along margin, about the size of calyx; calyx bluish- or reddish-violet, 4–6.5 mm long, in fruit 7–8 mm, membranous, with indument as on bracts, (13) 15-nerved, the 5 nerves leading to teeth thick, firm, the others thin, sometimes indistinct; teeth equal, approximately half as long as tube, separated by broad rounded sinuses, these at margin and the teeth within densely covered with long hairs; corolla 7.5–9 mm long, dark blue or sometimes reddish-violet, the tube 4.5–5 mm long, slightly exserted from calyx, expanding into an elongate neck (2–2.2 mm long, 1.5–1.8 mm wide); upper lip erect, 1.3–1.6 mm long, lateral lobes of middle [lower ?] lip short-tetragonal, slightly oblique, downcurved, 0.3–0.4 mm long, 1–1.2 mm wide, the middle lobe obliquely ascending, 1.2–1.6 mm long, 2–2.5 (3) mm wide, with triangular swelling from base to middle, concave in front, shallowly emarginate at apex; upper stamens shorter than upper lip; nutlets oblong-ellipsoid, 2 mm long, 0.5–1 mm wide, pale brown, with indistinct obtuse edge on ventral side. Fl. June–August; fr. from second half of July.

Stony and gravelly taluses in alpine belt and upper part of subalpine belt at altitudes of 2900–3800 m. — Centr. Asia: Pam.-Al. (Pamir, central, eastern and southwestern parts).

Gen. distr.: Ind.-Him. (E. Afghanistan and probably NW Himalayas). Described from mountains near Kabul in eastern part of Afghanistan. Type in Kew.

Note. This species was described under the three above-mentioned names. Duplicates of the types of *N. reniformis* Briq. and *N. fallax* Briq. are in the herbarium of the Botanical Institute of the Academy of Sciences of the USSR in Leningrad. Plants described under the name *N. fallax* develop short bostryces instead of semiverticels, a phenomenon very often observed in certain groups of *Nepeta*. Similar specimens of *N. spathulifera* have repeatedly been collected in Pamir.

Series 3. *Pungentes* Pojark. — Inflorescence a small terminal head formed by (1) 2–4 pairs of crowded cymes and several remote pairs of cymes; leaves subtending cymes (and bracts) rigid, with thick prominent nerves, spiny-tipped, usually longer than cymes; calyx narrowly cylindrical, in fruit ovoid, with linear- or lanceolate-subulate spinescent teeth separated by narrow incisions; upper lip of corolla shallowly cut into semiorbicular lobes; middle lobe of lower lip with round swelling at base, concave in front, entire, tapering to a claw. Plants of foothills and lower (sometimes middle) mountain belt.

429 Besides the three Central Asian species, *N. chenopodiifolia* Stapf from Iran also belongs to this series.

79. *N. pungens* (Bge.) Benth. emend. Stapf; Benth. Lab. gen et sp. (1834) 487, quoad nomen; Stapf, Bot. Ergebn. Polak. Exped. I (1885) 47; Lipsk. in Tr. Bot. sada, XVIII, 101, p. p.; Fedch. Perech. rast. Turk. V, 147, p. p.; Kryl. Fl. Zap. Sib. IX, 2312. — *Ziziphora pungens* Bge. in Ldb. Fl. Alt. I (1829) 23. — *Nepeta pusila* Benth. l. c. 438; in DC. Prodr. XII, 394; Ldb. Fl. Ross. IV, 382; Rgl. in Tr. Bot. sada, VI, 361. — **Ic.:** Ldb. Ic. pl. fl. Ross. II, tab. 124.

Annual; stem 5–25 cm long, erect, slender but sturdy, rather densely covered with very short downcurved basally thickened simple white hairs, 4-angled crimson-tinged along ribs and often all over, sometimes (in weak individuals) simple, mostly with 1–2 pairs of short branches, sometimes with a few long ramified branches from base; leaves bright green, covered with very short hairs, these sparse, simple, appressed above, more copious (to very copious) beneath, interspersed with capitate glandular hairs; lower leaves with petioles as long as or longer than blade, ovate, 4–12 mm long, 3–6 (9) mm wide, with truncate or rounded-cuneate base, obtuse or acute, with remotely toothed margin, thickish, with broad but not prominent nerves; middle leaves like the lower or narrower, to elliptic-lanceolate, acuminate, with shorter petioles; upper subtending leaves of 2–3 upper inflorescences short-petioled, narrowly lanceolate, somewhat rigid, with prominent thick nerves, rigidly subulate-pointed, the uppermost sometimes scarcely distinguishable from bracts; cymes 3–5-flowered, the upper 2–3 (4) pairs sessile or subsessile, forming an ovoid terminal head (10) 12–17 mm long, 12–15 mm wide, containing 12–20 flowers; 2–3 pairs of remote cymes below also sessile or subsessile, only the lower with developed peduncles 1–2.5 cm long; semiverticels sometimes replaced by bostryces, these 2.5 cm long, densely beset with bracts; bracts slightly longer than calyx, narrow, elliptic-lanceolate to lanceolate-linear, rigid, with thick hard nerves, curved, mostly conduplicate, long-spinescent; pedicels undeveloped; stems below inflorescence, peduncles, bracts and calyx outside roughened with very short thickened simple hairs and copious stipitate glands; calyx 5.5–
430 7 mm long, (13) 15-nerved; teeth subequal, 2/5 to 1/2 as long as calyx, erect, long-acuminate, spiny-tipped, the margin (as in bracts) stiffly ciliolate, the teeth inside and margins of incisions covered with antrorse long bristly hairs; corolla 7–8.5 mm long, sparingly pubescent outside, reddish or white, with red speckles on lower lip; tube slender, 4.5–5.8 mm long, slightly curved, abruptly expanding into neck 1–1.5 mm long, included to base of neck; upper lip 1.3–1.7 mm long, concave, slightly cleft; lateral lobes of middle [lower?] lip obliquely ovate, subpatent, 0.7–1 mm long, 1.5–1.7 mm wide; upper stamens 2/3 as long as upper lip, lower stamens barely exceeding its base, with anthers slightly smaller than in upper stamens; nutlets obovoid, 1.5 mm long, 1 mm wide, brownish-yellow, with indistinct edge on ventral side. Fl. May–June; fr. June–July.

Rocks, bluffs, slopes of riverbanks in low mountains and foothills. — Centr. Asia: Ar.-Casp. (western part), Balkh., Dzu.-Tarb. (foothills). **Gen. distr.:** Mong. (northwestern part). Described from Arkaul mountains in E. Kazakhstan. Type in Leningrad.

80. **N. fedtschenkoi** Pojark. sp. nov. in Addenda XIX, 360. — *N. pungens* auct. fl. turk. non Benth.: Lipsk. in Tr. Bot. sada, XVIII (1900) 101, p. p.; O. and B. Fedch. Perech. rast. Turk. V, 147, p. p.

Annual; root slender; stem 6–28 cm long, erect, with dense grayish indument, the hairs short, simple, white, recurved, more or less thickened toward base; stem simple only in the smallest individuals, usually branching, with 2–3 pairs of axillary fertile branches and often branching at base; branches long, often branching in turn; leaves pale, glaucouscent, the lower side paler, rather densely covered with short simple spreading hairs, the upper side subglabrous or with similar but appressed hairs; lower leaves (3) 6–22 mm long, (2.5) 5–13 mm wide, suborbicular to broadly ovate, with truncate or cuneate base, rounded or obtuse at apex, entire or incised-dentate with remote small acute teeth; the petioles slightly longer than blade; middle leaves similar to the lower or narrower, sublanceolate, acute, with larger teeth (4–6 per margin), like the lower leaves without prominent nerves, thickish, petioles as long as blade; uppermost leaves, i.e. those subtending the 2–3 upper pairs of cymes, sometimes resembling the middle leaves, but more often narrower, lanceolate, with thick prominent midribs and lateral veins, entire, acuminate but often without
431 a rigid point, rarely mucronate, short-petioled, usually exceeding inflorescence, including the terminal; cymes 3–8-flowered, 3–4 upper pairs clustered in capitate inflorescence, 1.5–2 cm long and as wide, 16–30-flowered, other pairs remote, the upper 1 or 2 sessile or on peduncles 2–5 mm long, the rest with peduncles 2–6 cm long; cymes sometimes replaced by elongate cymose racemes (bostryces) densely covered with bracts; bracts green or more or less anthocyanin-tinged, narrowly lanceolate, rigid, nerved, curved, terminating in subulate mucro, the outer slightly longer than calyx, the inner usually as long or slightly shorter; flowers sessile; pedicels not quite distinct; calyx 6–8 mm long, in flower narrowly cylindrical, in fruit ovoid, dilated above base, 13–15-nerved, erect, covered, like bracts, with very short basally thickened simple hairs, the lower part of tube (and margin of bracts) longer; teeth lanceolate-subulate, erect, ciliate, beset within and at margin of sinuses with long antrorse bristly hairs, spiny-tipped, the upper 2–2.5 mm long, ca. 1/2–2/3 times as long as tube, the lower 2.3–2.7 mm long; corolla 7.5–9 mm long, bluish judging by traces of color, hairy outside, included nearly to limb or to middle of neck; tube slender, long, 5–6.5 mm long, curved, expanding into neck 1.4–1.7 mm long; upper lip erect, 1.3–1.7 mm long, shallowly incised above; lateral lobes of middle lip subpatent, obliquely ovate, 0.8–1.2 mm long and wide; middle lobe with reniform limb ca. 1 mm long, 2 mm wide; upper stamens reaching the middle of upper lip of corolla, the lower disposed at level of margin of throat; anthers blue; nutlets ellipsoid-obovoid, 1.7 mm long, 1 mm wide, pale brown. Fl. May–June; fr. from first half of June.

Stony and rocky slopes in mountain-steppe belt. — Centr. Asia: Pam.-Al. (mountains of southwestern end of Gissar Range, Zeravshan Range), T. Sh. (Syugaty mountains). **Gen. distr.:** Dzu.-Kash. (Kuldja, T. Sh.), Iran, eastern part of Afghanistan. Described from Zeravshan Range, near Madm village. Type in Leningrad.

Note. In the structure of the inflorescence and in general habit, this species is very similar to *N. pungens* (Bge.) Benth. from which it is distinguished by the following

characters: absence of glandular hairs on parts of the inflorescence; blue (or lilac?) color of corolla; and floral leaves, at least in the upper cymes, not spinescent, foliaceous or, in any case, with well developed blade. In the structure of floral leaves in the upper inflorescences and the absence of glandular hairs, *N. fedtschenkoi* approaches the Iranian species *N. chenopodiifolia* Stapf (*N. pungens* Benth. quoad typ.), which, however, is readily distinguishable by its inflorescence: terminal head with more numerous flowers (up to 40), floral leaves of a more herbaceous consistency, length of peduncles gradually increasing toward base but not reaching that observed in *N. fedtschenkoi*.

81. *N. microcephala* Pojark. sp. nov. in Addenda XIX, 525. — *N. pungens* auct.: Bobrov in Tr. Bot. sada AN SSSR, XLIV (1931) 72, non Benth.

Annual; stem 4–24 cm long, erect or slightly ascending, with 4–5 (7) remote nodes, rather densely covered with minute recurved basally thickened simple white hairs sometimes interspersed with glandular hairs, green or violet-red, simple or with 1–2 (3–4) pairs of usually short fertile branches; leaves intensely or dark green, often violet-red beneath, the upper side with sparse appressed short thickish simple hairs, the lower side with rather copious spreading simple and glandular hairs, smooth (veins not prominent); lower leaves broadly ovate, 5.3–20 mm long, 7–14 mm wide, with rounded or truncate base, obtuse or rarely acute at apex, each margin with 3–6 remote small acute teeth, the petioles usually slightly longer than blade; other leaves (except those subtending terminal head) resembling the lower or narrower, narrowly elliptic to sublinear, tapering to narrow cuneate base, acute or acuminate at apex, the margin incised-serrate, the petioles 1/3–1/2 as long as blade; leaves subtending terminal head green or violet, narrowly lanceolate, long-acuminate, often aculeate, but more often narrower, bracteiform, rigid, curved, spinescent, only slightly wider than inflorescence; cymes loosely 3–5-flowered, upper pairs sessile, crowded in a small, 5–10 (13)-flowered head 7–12 mm long and as wide; other cymes distant, with slender peduncles (1) 2–5.5 cm long; bracts reddish-violet, as long as or slightly longer than calyx, curved, narrowly lanceolate, rigid, with thick midrib and 2 lateral nerves, spinescent, densely covered with minute simple hairs and sessile or short-stipitate small
435 lustrous glands, the margin with sparse longer basally thickened simple white hairs; flowers sessile; calyx in flower 5–7 mm long, 12–15-nerved, with indument as on bracts; teeth lanceolate-subulate, the upper half as long as tube, with bristly-ciliate margin, covered within and along margin of incisions with longer antrorse bristly hairs; corolla bluish (or bluish-lilac?), 6–7 mm long, scarcely exerted or even slightly shorter than calyx; tube 3–4 mm long, expanding into neck 1 mm long and 1.2–1.3 mm wide; upper lip 1.1–1.3 mm long, slightly cleft; lateral lobes of lower lip very oblique, ovate, ca. 0.8 mm long, 0.7 mm wide, subpatent, the middle lobe with reniform limb 0.6–0.8 mm long and 1.2–1.3 mm wide; upper stamens reaching the middle of upper lip of corolla, the lower not exceeding its base and nearly enclosed in neck of tube; anthers blue; nutlets obovoid, 1.2–1.3 mm long, 0.9–1 mm wide, brownish-yellow. Fl. (April?) May–June; fr. from second half of May. (Plate XXV, Figure 3.)

Gravelly and stony slopes and bottoms of ravines at altitudes of 1200–1600 mm. — Centr. Asia: Mtn. Turkm. (Greater Balkhan Mountains and central part of Kopet Dag). **Gen. distr.:** Iran. (N. Afghanistan: Badkhyz). Described from Greater Balkhan Mountains, Dyuineg Mountain. Type in Leningrad.

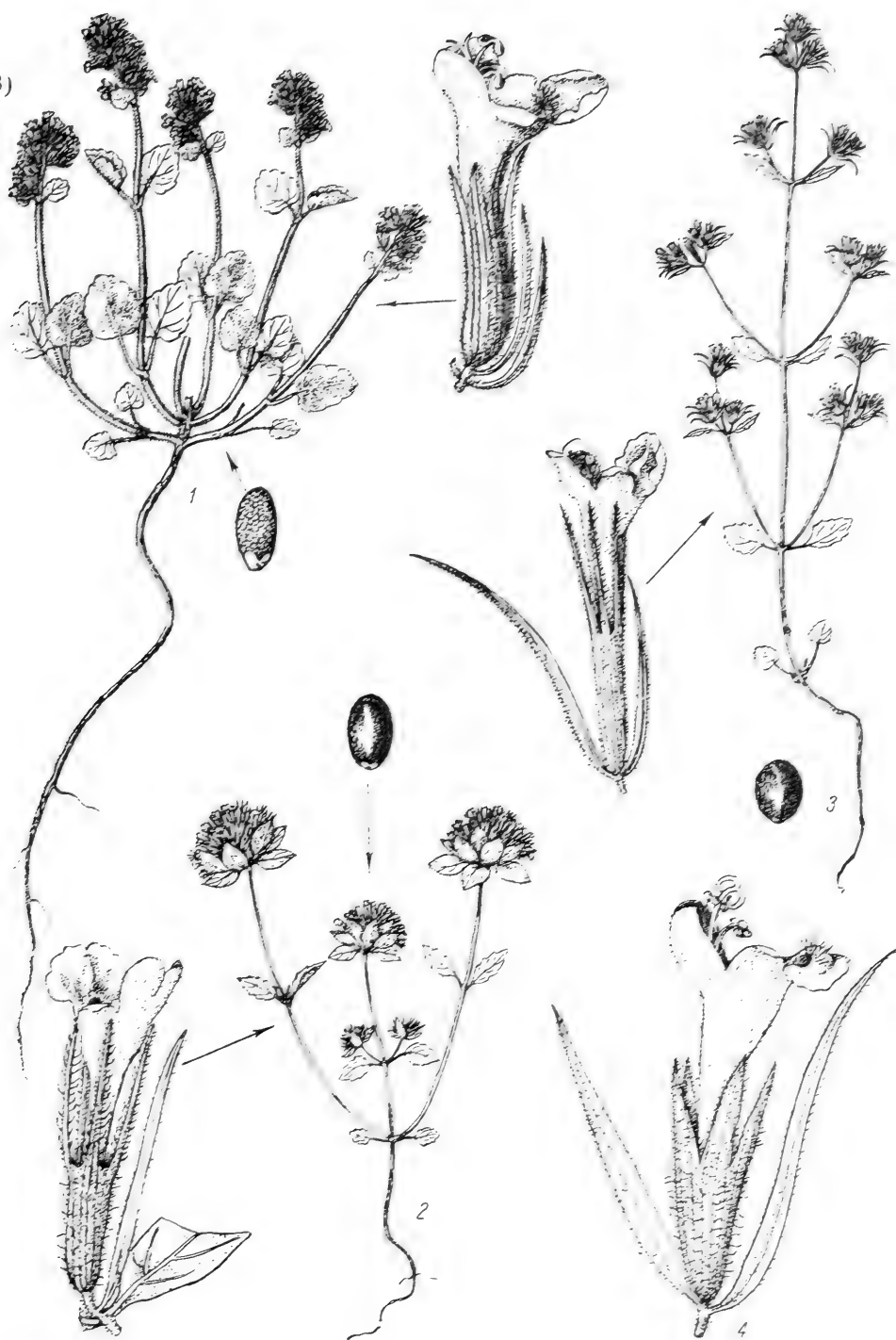


PLATE XXV. 1 — *Nepeta santoana* M. Pop., general aspect, flower, nutlet; 2 — *N. bracteata* Benth., general aspect, flower, nutlet; 3 — *N. microcephala* Pojark., general aspect, flower, nutlet; 4 — *N. satereioides* Boiss., flower.

Note. This species is very readily distinguished from other species of the series *Pungentes* by the few-flowered, small, terminal head (smaller than the axillary semiverticels), elongated peduncles in all the axillary semiverticels and smaller flowers with scarcely exserted corolla.

Series 4. *Satureioideae* Pojark. — Flowers in remote, sessile, few-flowered verticillasters; leaves subtending semiverticels bracteiform, slightly longer than calyx, rigid, lanceolate-linear, spiny-tipped; calyx-teeth lanceolate, aristate, separated by narrow incisions; upper lip of corolla concave, slightly emarginate, curved; middle lobe of lower lip tapering to broad claw, with drooping lobes. Monotypic series.

82. *N. satureioides* Boiss. Diagn. ser. 1, V (1844) 24; ej. Fl. or. IV, 667; Benth. in DC. Prodr. XII, 395; Bge. Lab. Pers. 58; Lipsk. in Tr. Bot. sada, XVIII, 104; O. and B. Fedch. Conspect. V, 147.

Annual; stem 4.5–55 cm long, slender but sturdy, erect, rather densely covered with fine spreading hairs interspersed, especially in upper part, with capitate glandular hairs, with 7–16 elongate internodes, branching from middle or from base; branches 1–4 pairs, 436 long, with numerous verticillasters, branching; leaves grayish, covered above with sparse, sometimes copious, appressed, simple hairs, usually densely covered beneath with fine, more or less implexed simple hairs interspersed with glandular, the margins with glandular and simple cilia; radical leaves long-petioled, ovate to oblong-elliptic 7–13 mm long, 4–7.5 mm wide, with cuneate base, obtuse or acute at apex, the margin closely serrate; cauline leaves 2.5–4.5 cm long, 4–7 mm wide, lanceolate, acuminate, gradually tapering to petiole, with few acute teeth in upper part; floral leaves lanceolate-linear or linear, spiny-tipped, the lower with few teeth in upper part or entire, $2\frac{1}{2}$ –3 times as long as semiverticels, the upper entire, bracteiform, equaling or slightly exceeding semiverticels; bracts linear-lanceolate, often conduplicate, curved, rigid, spiny-tipped, green or in upper part violet-tinged, as long as or slightly longer than calyx; verticillasters (4) 5 to 10, remote, sessile, small, dense, few-flowered, the lower larger, 5–8 (10)-flowered, the upper smaller, usually 3-, sometimes 2-flowered; calyx 6.2–7.2 mm long, narrowly tubular, straight, 15-nerved, beset (like bracts) with sparse short glandular hairs intermixed with simple, the margin with a thick fringe of long thin white simple hairs; teeth erect, equal (3–3.3 mm long), attenuate to a rigid spiny point, covered within and at margin of incisions with long antrorse bristly hairs; corolla 8.5–9 mm long, pubescent outside, in dry state light straw-colored, with dark brown middle lobe of lower lip; tube 5–5.5 mm long, curved, slender, abruptly expanding into neck, 1.6–2.2 mm long and 2–2.2 mm wide; upper lip 1.8–2 mm long, reclinate; lateral lobes of middle [lower?] lip obliquely ovate, 0.7 mm long, 1 mm wide, patent, the limb of middle lobe reniform, entire, strongly inflated at base; upper stamens inserted at base of upper lip, slightly exserted; lower stamens distinctly shorter, inserted at base of neck, with slightly smaller anthers; anthers bluish-black; style shorter than upper stamens; nutlets ellipsoid, ca. 1.7 mm long, 1 mm wide, pale brown, with an obtuse edge on ventral side. Fl. May–July; fr. from June. (Plate XXV, Figure 4.)

Dry, mainly stony slopes, rocks, river pebbles in foothills and low mountains to 2400 m. — Centr. Asia: Ar.-Casp. (Mangyshlak Peninsula: mountains of Kara-Tau), Mtn. Turkm.

(Badkhyz mountains), Kyz. K. (mountain outliers), T. Sh. (western part — northern tip of Syr Darya Kara-Tau), Pam.-Al. (Zeravshan Range, eastern part of Turkestan Range, Alai 437 Range, Darvaz, W. Pamir). **Gen. distr.:** Iran (Iran, Afghanistan). Described from C. Iran, near Isfahan. Type in Geneva. Duplicate of type in Leningrad.

Genus 1255.* **Glechoma**** L.

L. Sp. pl. ed. 1 (1753) 578. — Chamaeclema Moench, Meth. (1794) 393. — Generis Nepeta sect. Glechoma Benth. Lab. gen. et sp. (1832-1836) 484.

Flowers short-peduncled in axils of middle and upper cauline leaves; calyx tubular-campanulate, straight, 15-nerved, 2-lipped, with longer upper teeth, declined after flowering; corolla bluish-lilac, the tube inflated at throat; upper lip cut into semiorbicular lobes; lower lip broad, 3-lobed, with rather long thick hairs at middle of lower lip; anther-cells at right angles to each other. Perennials, with creeping stems and long radican shoots; leaves reniform or cordate, long-petioled, crenate.

Note. This genus contains 12 species of which five, *G. longituba* (Nakai) Kuprian., *G. grandis* (A. Gray) Kuprian., *G. hirsuta* W. et K., *G. brevituba* Kuprian., and *G. hederacea* L., are distributed in the forests of Eurasia. *G. hederacea* has been introduced into N. America.

G. decolorans (Hemsley) Turr., *G. nivalis* Jacquem., *G. complanata* (Dun.) Tur., *G. rotundifolia* Briq., *G. pharica* (Prain) Tur. and *G. tibetica* Jacquem. make up a distinctive group of xeromorphous Himalayan-Tibetan species, most of which were quite judiciously referred by Levin (Tr. Bot. inst. AN SSSR, V, 1941) to a new genus, *Pseudolophanthus* Levin.

- 1. Calyx-teeth 1/4-1/3 as long as tube; corolla 10-18 mm long 1. **G. hederacea** L.
- + Calyx-teeth half as long as tube; corolla 18-25 mm long. 2.
- 2. Whole plant covered with white spreading hairs; flowers in axils of middle and upper leaves in 4-6-flowered whorls 2. **G. hirsuta** W. et K.
- + Whole plant covered with short coarse hairs; flowers in axils of middle leaves in 2-flowered whorls 3. **G. longituba** (Nakai) Kuprian.

1. **G. hederacea** L. Sp. pl. ed. 1 (1753) 578; Maevsk. Fl. Sr. Ross. (1940) 612; Grossg. Fl. Kavk. III, 296; Kryl. Fl. Zap. Sib. IX, 2316; Kuprian. in Bot. zhurn. SSSR, XXXIII, 237, Plate 1, Fig. 1. — Nepeta glechoma Benth. Lab. gen. et sp. (1832-1836) 485; Ldb. 438 Fl. Ross. III, 379. — Chamaeclema hederacea Moench, Meth. (1794) 393. — Ic.: Maevsk., op. cit.; Hegi, Ill. Fl. V, 4, 2373. -- Exs.: Pl. Finl. exs. No. 889; Fl. pol. exs. No. 67; Fl. exs. Austro-Hung. No. 3721 (1).

Perennial, glabrous or very sparingly pubescent; stems 20-50 cm long, glabrous or with very short appressed downcurved hairs along ribs, procumbent or ascending, with numerous

* Treatment by L.A. Kupriyanova.
 ** From the Greek glechon, ancient name for corn mint.

radicant shoots; petioles of lower cauline leaves 5.6 cm long, those of middle leaves 2–3 cm long, nearly as long as blade; leaves with crenate margin, reniform or orbicular-reniform, the upper usually reniform-cordate; flowers in whorls of 3–4 in axils of middle and upper leaves; bracts shorter than pedicels, filiform, 1–1.5 mm long; corolla bluish-lilac, 10–18 mm long, usually 2–2½ times as long as calyx; calyx narrow, tubular, the triangular teeth abruptly acuminate, 1/4–1/3 as long as tube; nutlets brownish, 2 mm long. May–July.

Forests of the Soviet Union, shady riverbanks, coppices at forest margins, meadows, near dwellings. — European part: Kar.-Lap., Dv.-Pech., Balt., Lad.-Ilm., V.-Kama, U. Dnp., U.V., M. Dnp., V.-Don, Transv., U. Dns., Bes., Bl., L. Don (exceptionally!), L.V., Crim.; Caucasus: Cisc., Dag., W. and E. Transc.; West Siberia: universal; East Siberia: Yenisei (rarely), Lena-Kol. (rarely), Ang.-Say., Dau.; Far East: Ze.-Bu. (collected one time in Bureya), Uda. (Okhotsk area, introduced); Centr. Asia: Dzu.-Tarb. **Gen. distr.:** Scand., Atl. and Centr. Eur., Med. (NW), N. Am. (introduced). Described from N. Europe. Type in London.

2. *G. hirsuta* W. et K. Icon. et Descr. pl. rar. Hungar. II (1805) 124, tab. 119; Fedch. and Fl. Fl. Evrop. Ross. III, 803; Kupriyan. in Bot. zhurn. SSSR, XXXIII, 237, Plate 1, Fig. 2. — *G. hederacea* var. *hirsuta* Baumg. Enum. Stirp. Transs. II (1916) 165; Turr. Rep. Bot. soc. Exch. cl. Brit. Isles (1919–1920) 695. — *Nepeta glechoma* var. *hirsuta* Benth. Lab. gen. et sp. 485; Ldb. Fl. Ross. III, 380. — **lc.:** W. et K. l. c.; Kupriyan., op. cit. Exs.: Fl. pol. exs. No. 669; Fl. exs. Austro-Hung. No. 3722; Fl. exs. reip. bohem.-slov. No. 53; Gerb. Fl. SSSR, No. 3771 a, c.

Perennial; whole plant covered with long spreading white hairs; stems erect or slightly ascending, 30–80 cm long, with numerous creeping shoots; petioles of lower leaves 2–3 cm long, those of middle leaves up to 1 cm; leaves with crenate margin, the lower reniform-cordate, the middle cordate; flowers in 4–7-flowered whorls in axils of middle and upper leaves; bracts thin, filiform, slightly shorter than pedicels; corolla bluish-lilac, 18–20 (25) mm long, the broad tube 3½ times as long as calyx; calyx hairy, narrow, tubular, 439 8–10 mm long, the teeth subulate-acuminate, half as long as tube; nutlets brownish, 4 mm long. April–May.

Broadleaved forests. — European part: V.-Kama (vicinity of Kazan'), U. Dnp. (south), U.V. (south and southwest), V.-Don (rarely), M. Dnp., U. Dns., Bes., Bl. **Gen. distr.:** Centr. Eur., W. Med., Bal. (north). Described from Hungary. Type in Prague.

Note. Forms that are intermediate between *G. hederacea* L. and *G. hirsuta* W. et K. occur in forests with elements of broadleaved species in the Leningrad and SW Vologodskaya regions. In 1920, Grebner described plants from Lithuania similar to these as a separate species, *G. hindenburgiana* Grebn. (Fedde, Repert. 1920, 61).

3. *G. longituba* (Nakai) Kuprian. in Bot. zhurn. SSSR, XXXIII (1948) 236, Plate 1, Fig. 4. — *G. hederacea* var. *longituba* Nakai in Tokyo Bot. Mag. XXXV (1921) 173, Kom. and Alis. Opred. rast. Dal'nevost. kraya, II, 900. — **lc.:** Kupriyan., op. cit.

Perennial, tinged with violet in lower and upper parts; stem 30–70 cm long, slender, ascending, covered, especially at the edges, with short coarse downturned hairs, with radicant shoots; petioles of lower leaves 1.5–2.5 cm long, those of middle leaves ca. 1 cm

long; lower leaves reniform-cordate, the middle cordate, roughened above with short coarse hairs, these densely covering the veins beneath where intermixed with short black glands; flowers usually paired in axils of middle leaves; bracts equaling or exceeding pedicels, subulate-filiform, 2-3 mm long; corolla bluish-lilac, 20-25 mm long, with slender long tube; corolla usually 2½-3 times as long as calyx; calyx narrow, tubular, 8-10 mm long, the teeth subulate-acuminate, half as long as tube; nutlets brownish, 2 mm long. May-June.

Broadleaved forests, coppices, riverbanks. — Far East: Uss. (south). **Gen. distr.:** Korea, China (Manchuria). Described from Korea. Type in Tokyo.

Genus. 1256.* **Dracocephalum**** L.

L. Sp. pl. (1753) 594. — Ruyschiana Boehr. ex Mill. Gard. Dict. ed. VII (1759). — Moldavica Adans. Fam. II (1763) 190. — Zornia Moench, Meth. (1794) 410 ex parte.

Calyx tubular or tubular-campanulate, 15-nerved, straight or curved, 2-lipped, the upper lip 3-toothed, its teeth 1/3-1/2 as long as the lanceolate teeth of lower lip, or else calyx obscurely 2-lipped, with subequal teeth, the middle tooth of upper lip broader than the others, the base of teeth nearly always with a thickened fold, this very noticeable when
 440 viewed from the side; calyx-teeth usually with very prominent transverse nerves (anastomoses); corolla 2-lipped; tube narrow at base, widening at throat; upper lip erect or slightly curved, notched at apex or more or less deeply cleft; lower lip 3-lobed, with larger middle lobe; stamens 4, the upper pair slightly longer than the lower, the filaments as long as corolla or (rarely) exerted; anthers glabrous or hairy, 2-celled, the cells divergent; style with 2 equal subulate lobes; nutlets oblong, smooth. Perennial herbs, sometimes becoming woody below; flowers in verticillasters in the axils of upper leaves, usually forming a compact globular or a lax oblong inflorescence.

Forty-five species in extratropical parts of Asia and in Centr. Europe; one species (*D. parviflorum* Nutt.) in N. America.

- 1. Anthers pubescent 2.
- + Anthers glabrous 4.
- 2. Leaves deeply 3-5-partite, with linear or oblong obtuse lobes; calyx villous 34. **D. austriacum** L.
- + Leaves entire; calyx short-hairy 3.
- 3. Stem and calyx puberulent; bracts subovate, densely ciliate; corolla 20-25 (28) mm long 33. **D. ruyschiana** L.
- + Stem subglabrous; bracts ciliate; calyx finely pubescent only in lower half, subglabrous above; corolla 35-40 mm long 32. **D. argunense** Fisch.
- 4. Annuals 5.
- + Perennials 7.
- 5. Flowers small; corolla 7-9 mm long, slightly exceeding calyx 18. **D. thymiflorum** L.

* Treatment by B.K. Shishkin.
 ** From the Greek *dracon*, dragon, and *cephale*, head, from the shape of the corolla.

- + Flowers larger; corolla 15–25 mm long, 2–2½ times the length of calyx 6.
- 6. Plant 5–15 cm high, with disagreeable odor; leaves 0.5–1.5 cm long, 0.3–0.8 cm wide; corolla 15–18 mm long 22. **D. foetidum** Bge.
- + Plant (15) 20–50 cm high, pleasantly scented; leaves 1.5–3 cm long, 0.7–1.8 cm wide; corolla 18–25 mm long 23. **D. moldavica** L.
- 7. Stamens more than twice as long as corolla (Centr. Asia). 35. **D. stamineum** Kar. et Kir.
- + Stamens not exceeding corolla or very slightly exerted 8.
- 441 8. Calyx markedly 2-lipped, the upper lip cleft to 1/3–1/4, its 3 teeth subequal, ovate, the lower lip cleft to 1/4 or nearly to base 9.
- + Calyx not markedly 2-lipped, all teeth subequal, the middle tooth of upper lip often much wider than the others 16.
- 9. Bracts with 1–3 aristate teeth on each margin 10.
- + Bracts foliaceous, with obtuse teeth or entire, sometimes with aristate teeth . . 14.
- 10. Cauline leaves broadly ovate, subulate-dentate, all teeth subulate-pointed (W.T. Sh.) 28. **D. spinulosum** M. Pop.
- + Teeth of cauline leaves obtuse or acute but not subulate-pointed or very rarely some teeth subulate-pointed 11.
- 11. Stems usually decumbent or the central (if present) erect, 5–19 cm long; leaf blade subreniform or broadly ovate, with cordate base, 1.2–2.5 cm long, 2–2.5 cm wide, evenly toothed 26. **D. heterophyllum** Benth.
- + Stems erect or ascending, 20–70 cm long; leaf blade ovate or lanceolate-ovate, cuneately tapering to base, 1–4 cm long, 0.3–1.5 cm wide, unevenly toothed, pinnatifid, sometimes bipinnate or leaves entire. 12.
- 12. Leaves deeply pinnatisect (sometimes nearly to midrib), sometimes bipinnate. 25. **D. bipinnatum** Rupr.
- + Leaves almost entire or with shallow teeth or lobes not reaching midrib of leaf . 13.
- 13. Bracts with a point 1–2 mm long; cauline leaves acuminate, entire or toothed, the teeth aristate 24. **D. peregrinum** L.
- + Bracts with awn 3–5 mm long; cauline leaves obtuse, entire or toothed, the teeth not aristate 27. **D. diversifolium** Rupr.
- 14. Leaves broadly ovate, with cordate base; bracts similar to leaves but smaller, not aristate; calyx densely villous, without yellow glands . . 29. **D. komarovii** Lipsky.
- + Leaves ovate, with cuneately tapering or lanceolate base; bracts with a long subulate point; calyx very short-hairy, with some remote, yellow, punctate glands . 15.
- 442 15. Calyx-teeth with point 0.5 mm long (Mtn. Turkm.) 31. **D. subcapitatum** (Ktze.) Lipsky.
- + Calyx-teeth with subulate point 1.5–2 mm long (Caucasus) 30. **D. multicaule** Montbr. et Auch.
- 16. Leaves lanceolate or lanceolate-linear, acute, entire or few-toothed 17.
- + Leaves orbicular-ovate or oblong, obtuse at apex, the margins with rounded obtuse teeth or pinnatifid 18.
- 17. Leaves and their lateral teeth (if present) terminating in a subulate point 0.5–1.5 mm long (E. Siberia) 15. **D. fruticosum** Steph.
- + Leaves acute, not subulate-pointed (Altai and Centr. Asia). . 16. **D. integrifolium** L.

18. Stems procumbent, 1.5–8 (12) cm long, with ascending branches, forming a dense tuft; leaves small, the blades 3–15 (20) mm long, orbicular-ovate or ovate, more or less deeply and evenly cut into rounded teeth 19.
- + Stems solitary or many, usually erect, 12–70 cm long, not forming a dense tuft; leaves often larger 25.
19. Bracts long-cuneate at base, entire or with 3 short teeth above (Caucasus) 7. **D. botryoides** Stev.
- + Bracts with 4–7 aristate teeth 20.
20. Middle tooth of upper lip of calyx 1½–2 times broader than long and 4–5 times as broad as lateral teeth; bracts equaling or shorter than calyx 21.
- + Middle tooth of upper lip of calyx longer than broad and up to 3 times as broad as the lateral 29.
21. Bracts and calyx without punctate glands, their teeth short-pointed at obtuse apex; corolla 10–12 mm long. 6. **D. paulsenii** Briq.
- + Bracts and often calyx copiously punctate-glandular, their teeth subulate-pointed; corolla 13–15 mm long (Alt., Ang.-Say.) 5. **D. discolor** Bge.
22. Corolla 15–30 mm long, the upper lip much longer than the lower; style exerted 5–7 mm 2. **D. palmatum** Steph.
- + Corolla 12–18 mm long, upper lip about as long as the lower; style only slightly exerted 23.
23. Bracts with 2–3 teeth, often entire; leaf blade 2 cm long, 1–2 cm wide (E. Siberia) 1. **D. pinnatum** L.
- + All bracts with 3–7 teeth; leaf blade 0.5–1.2 cm long, 0.4–1 cm wide 24.
24. Corolla 12–15 mm long; bracts often bluish, all teeth aristate, the terminal only slightly broader than the others 3. **D. organoides** Steph.
- + Corolla 20–22 mm long; bracts reddish-violet, the terminal tooth much broader than the others, commonly obtuse 4. **D. bungeanum** Schischk. et Serg.
25. Bracts entire or very often with 1 tooth 26.
- + Bracts toothed in upper half. 29.
26. Leaves dark green above, whitish-gray beneath with fine tomentum (Kuznetskii Ala-Tau) 14. **D. krylovii** Lipsky.
- + Leaves concolor, green or grayish-green on both sides 27.
27. Calyx 6–8 mm long; flowers often nodding; inflorescence elongate and lax after flowering, to 10–40 cm long, ca. 2 cm wide; corolla blue 17. **D. nutans** L.
- + Calyx 13–17 mm long; inflorescence capitate, only slightly elongating after flowering 28.
28. Leaf-blade orbicular or broadly ovate, with cordate or cuneately tapering base, evenly and obtusely toothed, about as long as wide; bracts shorter than calyx 11. **D. stellerianum** Hiltebr.
- + Leaf-blade oblong or ovate, toothed or sometimes nearly entire, cuneate at base; bracts longer than calyx 12. **D. fragile** Turcz.
29. Leaves green above, white-tomentose beneath (Far East). 13. **D. multicolor** Kom.
- + Leaves more or less hairy beneath but not tomentose 30.
30. Lower and middle cauline leaves with petioles slightly shorter than blade (Centr. Asia) 31.

- + Lower and middle leaves with petioles as long as or longer than blade 33.
- 31. Teeth of bracts terminating in awn 2–4 mm long; calyx 11–12 mm long, calyx-teeth
aristate 19. **D. nodulosum** Rupr.
- 444 + Teeth of bracts terminating in mucro 0.5–1 mm long; calyx 12–20 mm long 32.
- 32. Calyx 20 mm long; corolla 35 mm long; leaves 1–3 cm long, 4–7 mm wide
. 21. **D. scrobiculatum** Rgl.
- + Calyx 12–15 mm long; corolla 25–30 mm long; leaves 1–2 cm long, 5–10 mm wide
. 20. **D. oblongifolium** Rgl.
- 33. Radical leaves oblong-ovate, longer than broad; flowers large; corolla 30–45 mm
long, the upper lip long-lanate inside 34.
- + Radical leaves orbicular-cordate or orbicular-reniform, not longer than broad; corolla
25–30 mm long, the upper lip glabrous inside 10. **D. imberbe** Bge.
- 34. Stems hairy, especially in lower part; corolla intensely blue
. 8. **D. grandiflorum** L.
- + Stems glabrous; corolla pink-lilac (Gissar Range). 9. **D. formosum** Gontsch.

Subgenus 1. **Eudracocephalum** Briq. in Pflanzenfam. 3a and 3b (1897) 239. — Anthers glabrous; stamens not exerted from corolla.

Section 1. **Buguldea** Benth. in DC. Prodr. XII (1848) 398. — Calyx 2-lipped, upper lip 3-toothed, the middle tooth 2–3 times as wide as the others, lower lip with 2 lanceolate teeth.

Subsection 1. *Keimodracontes* Briq., l. c. — Sect. *Keimodracon* Benth. Lab. gen. et sp. (1832–1836) 491 et in DC. Prodr. XII (1848) 396. — Stems spreading, strongly branching, forming dense tuft; leaves incised-crenate or palmatipinnatisect; flowers in capitate or oblong inflorescence.

1. **D. pinnatum** L. Sp. pl. (1753) 594; Hiltebr. Monogr. Dracoceph. 43, 72; Turcz. Fl. baic.-dahur. II, 377. — **D. pinnatifidum** Lam. Encycl. Meth. II (1786) 319. — **D. pinnatum** β . baicalense Bge. Suppl. Fl. Alt. (1836) 53. — **D. pinnatum** α . vegetius Ldb. Fl. Ross. III (1846–1848) 388. — **Ic.**: Hiltebr. l. c. tab. 10; Pall. Fl. Ross. tab. 111.

Perennial; rhizome creeping or ascending, 3–4 mm thick, branching above; stems few, erect or ascending, densely covered with short spreading hairs, simple or few-branched, 5–15 cm long; leaves with petiole 5–12 mm long, the blade ovate-orbicular or oblong, 1–2 cm long, 0.8–1.5 cm wide, cordate or abruptly cuneate-attenuate at base, villous on both sides or white-tomentose beneath, pinnatisect, sometimes palmatisect, the oblong teeth rounded at the ends; flowers short-pedicel, in verticillasters at end of stem forming an inflorescence, this compact capitate in flower, later oblong; bracts longer than calyx, cuneate, villous-ciliate, pinnatifid in upper half, the lobes produced into a fine point, the middle lobe ovate, the lateral lobes lanceolate; calyx 12–13 mm long, villous; middle tooth of upper lip elliptic-oblong, 1½–2 times as broad as the others, all teeth

subulate-pointed; corolla bluish-azure, ca. 18 mm long, soft-pubescent outside, upper lip slightly curved, as long as the lower. June–July. (Plate XXVI, Figure 2.)

Stony and sandy slopes, coastal pebbles. — East Siberia: Ang.-Say. (western shore of Baikal), Dau. **Gen. distr.:** Mong. Described from Siberia. Type in London.

Note. According to Bentham, the Caucasian plant *D. botryoides* Stev. is preserved in the Linnaean herbarium under the name of *D. pinnatum*.

2. *D. palmatum* Steph. ex Willd. Sp. pl. III (1800) 151; Hiltebr. Monogr. Dracoceph. 52, 76; Ldb. Fl. Ross. III, 382. — **lc.:** Hiltebr. l. c. tab. 14.

Perennial; rhizome creeping or ascending, 0.5–0.8 cm thick; stems many, covered with spreading hairs, 5–12 cm long; petioles patent-hairy, slightly widening at base, 0.5–2 cm long; leaves ovate-orbicular or broadly ovate, with truncate or obscurely cordate base, deeply pinnatifid (but not to midrib), with oblong obtuse often involute lobes, densely hairy on both sides or almost canescent beneath, 4–10 mm long and nearly as wide; upper leaves often smaller, short-petioled or sessile; flowers short-pedicel, in verticillasters at end of stem forming an oblong inflorescence; bracts lanceolate spiny-tipped teeth; calyx often violet, ca. 10 mm long; middle tooth of upper lip rounded-obovate, mucronate, obscurely denticulate, 3 times as wide as lateral teeth, the lower lip with 2 narrowly lanceolate teeth; corolla 20–30 mm long, pale straw-colored, slightly villous outside, upper lip much longer than the lower; style often strongly exserted; nutlets ovoid, faintly 3-angled, ca. 2 mm long, 1 mm wide. July. (Plate XXVII, Figure 2.)

Sandy deposits and bluffs, gravelly slopes in stony and mottled tundras. — Arctic: Chuk., An.; East Siberia: Lena-Kol.; Far East: Okh. Endemic. Described from Siberia. Type in Berlin.

3. *D. origanoides* Steph. ex Willd. Sp. pl. III (1800) 151; Kryl. Fl. Zap. Sib. IX, 2321. 446 — *D. pinnatum* α . *altaicum* Bge. Suppl. Fl. Alt. 1836 53. — *D. pinnatum* α . *minus* Ldb. Fl. Ross. III (1846–1848) 384; Kryl., Fl. Alt. IV, 1034. — *D. pinnatum* L. var. *pallidiflorum* Kar. et Kir. in Bull. Soc. Nat. Mosc. XV (1842) 422. — *D. villosum* Krassn. in Bot. zap. II (1887–1888) 19. — *D. pinnatum* Lipsky in Tr. Bot. sada, XXVI (1909) 604, non L. — *D. pinnatum* var. *songaricum* Lipsky, l. c. 605.

Perennial; rhizome 3–5 mm thick, branching in upper part; stems numerous, procumbent and often radicant; branches erect, 2–8 cm long, covered with long reclinate simple hairs; leaves with hairy petiole as long as or longer than blade, orbicular-ovate or ovate, at base often subcordate, 0.5–1.2 cm long, 0.4–0.8 cm wide, rather shallowly cut into 5–9 rounded-ovate lobes or large teeth, hairy on both sides (more densely beneath), with sessile punctate glands; flowers at ends of stems in dense ovoid or subglobular heads; bracts 10–14 (15) mm long, obcuneate, bluish, finely long-ciliate, cut at apex into 5–7 (rarely 4) teeth, the lateral linear-lanceolate, the middle one ovate-lanceolate, all thin-pointed; calyx 8 mm long, often bluish, finely pubescent, obscurely 2-lipped, middle tooth of upper lip aristate, 1½ times as wide as the others, these lanceolate, also aristate; corolla blue, 12–15 mm long, puberulent outside and at base of lower lip within; lower lip slightly longer than the upper. June–July.

Gravelly and stony slopes, moraines near glaciers. — West Siberia: Alt.; East Siberia:

Ang.-Say.; Centr. Asia: Dzu.-Tarb., T. Sh. **Gen. distr.:** Mong., Ch. (Sinkiang). Described from Siberia. Type in Berlin.

4. **D. bungeanum** Schischk. et Serg. in Kryl. Fl. Zap. Sib. IX (1937) 2322. — **D. origanoides** Bge. Suppl. Fl. Alt. (1836) 54, non Steph.: Ldb. Fl. Ross. III, 384.

Perennial; rhizome long, 3–5 mm thick, branching above; stems many, procumbent; branches erect or ascending, 2–8 cm long, patent-hairy, the hairs short in lower part, longer above, interspersed with short glandular hairs; leaves on hairy petioles nearly as long as blade, orbicular-ovate or ovate, sometimes cordate at base, shallowly cut into 5–9 ovate or round large teeth, glandular-hairy on both sides, more densely beneath, 5–12 mm long, 4–10 mm wide; flowers in compact globular or ovoid heads; bracts longer
447 than calyx, obovate, cuneate at base, violet-tinged, long-hairy at margins, cut at apex into 5–7 lobes, the terminal subovate, commonly obtuse, the lateral lobes narrower, lanceolate, thin-pointed; calyx tubular-campanulate, long-hairy, pale purple, obscurely 2-lipped, upper lip 3-lobed, the middle lobe $1\frac{1}{2}$ times as wide as the lateral, aristate, lower lip 2-partite, with lanceolate aristate lobes; corolla dark blue, 20–22 mm long, puberulent outside and at base of lower lip within, upper lip orbicular-ovate, shallowly cleft at apex, lower lip nearly as long as the upper, the middle lobe reniform, nearly twice as broad as long, very slightly emarginate, the lateral lobes broadly ovate, $2/7$ – $1/3$ as wide as the middle lobe. June–July.

Alpine belt along pebbly slopes and old moraines. — West Siberia: Alt. **Gen. distr.:** Mong. Described from Altai. Type in Leningrad.

5. **D. discolor** Bge. Suppl. Fl. Alt. (1836) 51; Benth. in DC. Prodr. XII, 397; Ldb. Fl. Ross. III, 383; Kryl. Fl. Zap. Sib. VIII, 2320. — **lc.:** Ldb. Ic. pl. fl. Ross. II, tab. 128 (sub. *D. origanoides*).

Perennial; rhizome 3–5 mm thick, branching in upper part; stems numerous, procumbent and often radicant, covered with remnants of dead leaves; branches erect, 2–8 cm long, short-hairy; leaves with pubescent usually long-ciliate petioles as long as blade, ovate, with subcordate or truncate base, 0.4–1 cm long, 0.2–0.8 cm wide, deeply (nearly to midrib) pinnatisect, with linear-oblong obtuse often revolute-margined lobes, green puberulent above, white-tomentose beneath; flowers at ends of branches in dense ovoid or oblong inflorescences; pedicels 1–3 mm long; bracts obcuneate, long-ciliate at margin, often punctate-glandular, cut at apex into 3–5 aristate lobes, the lateral lanceolate, the middle one ovate or oblong-ovate; calyx pale purple, pubescent, commonly with punctate lustrous glands, the tube cylindrical, the 2-lipped limb nearly as long as tube; lateral lobes of upper lip ovate-lanceolate, aristate, the middle lobe $1\frac{1}{2}$ –2 times as wide as long, 4–5 times as wide as lateral lobes, emarginate at apex, with 1–3 aristate teeth, lobes of lower lip lanceolate, awned-acuminate; corolla dark blue, short-hairy outside and at base of lower lip within, 12–15 mm long; upper lip cut to middle into 2 lanceolate lobes, incised at apex, crenate at margins, 4–5 times as broad as the ovate lateral lobes; style usually not exerted. May–June.

448 Exposed stony and gravelly slopes, dry steppes. — West Siberia: Alt.; East Siberia: Ang.-Say. **Gen. distr.:** Mong. Described from Altai. Type in Leningrad.



PLATE XXVI. 1 – *Dracocephalum scrobiculatum* Rgl., part of plant, calyx, flower, bract; 2 – *D. pinnatum* L., general aspect, calyx, flower, bract; 3 – *D. bipinnatum* Rupr., part of plant, flower, bract, calyx.

6. **D. paulsenii** Briq. in Bot. Tidsskr. 28 (1908) 238. — *D. discolor* Lipsky in Tr. Bot. sada, XXVI (1906) 599, non Bge. — **lc.:** Briq. l. c. fig. 4.

Perennial; rhizome ca. 8 mm thick, branching at the end; stems numerous, densely covered with short spreading hairs, 5–15 cm long; leaves with petioles 2–3 mm long, ovate, deeply pectinately pinnatifid with revolute-margined incisions, green, appressed-puberulent above, white-tomentose beneath (?), 3–4 mm long and as wide; flowers short-pedicel; verticillasters in the axils of upper leaves forming globular-ovoid or oblong inflorescences 2–3 cm long and 1.5 cm wide; bracts elliptic, pinnatifid, with obtuse incisions, short-acuminate lobes, purple or purplish-blue, sparsely villous; calyx tubular-campanulate, more or less patent-hairy, 6–7 mm long, 2-lipped; middle tooth of upper lip broadly ovate, the lateral teeth narrowly ovate, the 2 teeth of lower lip ovate-lanceolate, all short-acuminate; corolla violet-blue, often with more deeply colored small spots, densely puberulent outside, 10–12 mm long. July–August.

Stony slopes in alpine belt. — Centr. Asia: Pam.-Al., T. Sh. **Gen. distr.:** China (Sinkingiang). Described from Pamir. Type in Copenhagen.

7. **D. botryoides** Stev. in Mém. Soc. nat. Mosc. III (1812) 266; Bge. Suppl. Fl. Alt. 41; Ldb. Fl. Ross. III, 383; Boiss. Fl. or. IV, 671; Grossg. Fl. Kavk. III, 297. — *Nepeta pinnatifida* Fisch. Catal. hort. Gorenk. (1812) 11, nom. nud.

Perennial; rhizome ascending, 0.5–1 cm thick, branching above; stems usually numerous, spreading or ascending, simple or branching, 10–12 cm long, densely covered with patent or slightly retrorse hairs; leaves with hairy petioles 0.5–1 cm long, ovate-orbicular, at base truncate or cuneate, sometimes subcordate, 10–15 mm long, 8–12 mm wide, deeply pinnatisect with oblong obtuse teeth, covered on both sides, more densely beneath, with grayish hairs; flowers short-pedicel; verticillasters forming capitate or oblong inflorescences, rarely lowermost whorl more or less distant; bracts cuneate, with mucro ca. 1 mm long, entire or with 1–2 aristate teeth, villous, 7–8 mm long; calyx ca. 10 mm long, violet-tinged, middle tooth of upper lip broadly ovate, twice as wide as lateral teeth, all teeth aristate; corolla 15–18 mm long, pale violet, upper lip erect, slightly shorter than lower lip. Fl. July–August; fr. August–September.

Stony slopes, pebbles near streams, rocks in alpine belt at altitudes of 2500–3600 m. — Caucasus: Dag., E. and S. Transc. (Zangezur). Endemic. Described from Caucasus. Type in Helsinki.

Subsection 2. *Calodracontes* Briq. in Pflanzenfam. IV, 3a and 3b (1897) 239. — Section *Calodracon* Benth. Lab. gen. et sp. (1832–1836) 421. — Stems erect, sometimes few-leaved; radical leaves long-petioled, crenate; flowers in capitate or oblong inflorescences.

8. **D. grandiflorum** L. Sp. pl. (1753) 595, ex parte; Benth. Lab. gen. et sp. (1832–1836) 421 et in DC. Prodr. XII, 399; Hiltebr. Monogr. Dracoceph. 48, 74; Ik.-Gal. and Il'in in Tr. Bot. inst. AN SSSR, ser. 1, 3 (1936) 271. — *D. altaianse* Laxm. in Nov. Comm. Ac. Petrop. XV (1770) 556; Ldb. Fl. Ross. III, 385; Lipsk. in Tr. Bot. sada, XXVI, 577; Kryl. Fl. Zap. Sib IX, 2323. — *D. turkestanicum* Gand. in Bull. Soc. Bot. Franc. LXV (1918) 66. — **lc.:** Laxm. l. c. tab. 29, fig. 3; Bot. Mag. 25, tab. 1009; Pall. Fl. Ross. tab. 112; Ik.-Gal. and Il'in., op. cit. Fig. 1.

Perennial; rhizome horizontal or ascending, 0.5–1 cm thick, branching above, producing few fertile stems and bundles of radical leaves; stems erect or ascending at base, simple, puberulent, more densely in upper part, 10–30 cm long; petioles 1½–2 times as long as blade, dilated at base; leaf-blade oblong-elliptic or oblong, ovate, obtuse, cordate at base, crenate at margin, 2–8 cm long, 1–4 cm wide, more or less hairy beneath along the veins, subglabrous above; cauline leaves 3–4 pairs, short-petioled, ovate or orbicular-ovate, smaller; flowers short-pedicel in a dense subcapitate inflorescence, sometimes with a distant lower whorl; bracts obovate, cuneately tapering toward base and here entire, cut in upper half into teeth of which the middle one ovate-lanceolate, the others lanceolate, thinly acuminate, slightly exceeding or about as long as calyx, this covered with long fine hairs, nearly 2-lipped; middle lobe of upper lip ovate, mucronate, 1½–2 times as long as the broadly lanceolate aristate lateral lobes; lobes of lower lip narrowly lanceolate; corolla 35–45 mm long, intensely blue, puberulent outside, long-hairy within on lobes of upper lip and at base of middle lobe of lower lip; upper lip cut to 1/3 into semiorbicular lobes; lower lip 1½ times as long as the upper, the middle lobe reniform, 2–3 times as broad as lateral lobes; nutlets ovoid, black, ca. 3 mm long. June–July.

Alpine meadows, near glaciers, on rocks and stony slopes. — West Siberia: Alt.; East Siberia: Ang.-Say., Dau., Lena-Kol. (Kalarskii district); Centr. Asia: Dzu.-Tarb., T. Sh., Pam.-Al. (Alai Range). **Gen distr.:** Mong., Ch. (Sinkiang). Described from Altai. Type in London.

Note. The synonymy of the genus is very confusing. In establishing this species, Linnaeus refers to the brief description of the plant supplied to him by J. Gmelin. The geographical indications given by Gmelin in “Flora sibirica” (III, 234) are: “Intra valles rupium Bargusinensium et earum quae existunt ad Maiam et Indomam b. Stellerus observavit.” A species widely distributed in the Barguzin mountains is better known as *D. altaianse* Laxm., while a different species, determined as *D. stellerianum* Hiltebr., occurs in Maia and Indom. We propose to retain the Linnaean name for the plant that grows extensively in Siberia and in the mountains of Central Asia.

Economic importance. The plant is beautiful in flower and could be used as ornamental.

9. *D. formosum* Gontsch. in Bot. mat. gerb. Bot. inst. AN SSSR, VII, 5 (1938) 101.

Perennial; stems erect, glabrous, 4-angled, obscurely sulcate, 20–60 cm long, to 4 mm thick at base; radical leaves with petiole 9–13 (28) cm long, broadly triangular-ovate or oblong-ovate, 6–10 cm long, cordate at base, rounded at apex, crenate, glabrous, bright green; lower cauline leaves with petioles shorter than blade, ovate, cordate at base, 3–5 cm long, rounded at apex, crenate; upper leaves sessile, subcordate at base; floral leaves sessile, broadly ovate, obtuse at apex, dentate, 2–2.5 cm long; inflorescence dense, ovaloid or subglobose, 7–10 cm long; outer bracts suborbicular, the upper oval, acute, with dentate margin, the teeth with a purple awn 1–2.5 mm long; inner bracts oblanceolate, acute, with long aristate teeth in upper half; bracteoles lanceolate, acuminate, pubescent, 1.5–3 mm long; pedicels 2–3 mm long, hairy; calyx tubular, 20–22 mm long, puberulent and sparsely punctate-glandular, nearly 2-lipped; upper lip less deeply cleft and hence its lobes slightly shorter than the lanceolate lobes of lower lip; middle lobe of upper lip much broader and slightly longer than the others, ca. 8 mm long, the others ca. 7 mm long; corolla 3–4.3 cm long, pink-lilac, hairy outside, the tube 14–18 mm long, narrow in lower

part, inflated above, 8–10 mm long, 2-lobed at apex, with rounded lobes; lower lip slightly longer than the upper, 3-lobed, the middle lobe reniform, ca. 5 mm long, 8–10 mm wide, emarginate, 2–3 times as wide as lateral lobes; filaments hairy. June–July.

Subalpine belt, damp meadows. — Centr. Asia: Pam.-Al. Endemic. Described from Gissar Range. Type in Leningrad.

10. *D. imberbe* Bge. Suppl. Fl. Alt. (1836) 50; Ldb. Fl. Ross. III, 385; Lipsk. in Tr. Bot. sada, XXVI, 579; Kryl. Fl. Zap. Sib. VIII, 2322. — *D. altaiese* Hiltebr. Monogr. Dracoceph. 50, 75, non Laxm. — *D. imberbe* var. *laniflorum* Herd. in Bull. Soc. Nat. Mosc. XLI, 1 (1868) 383. — *D. laniflorum* Rupr. in Mém. Acad. Pétersb. VII sér. XIV, 4 (1869) 65. — *D. alberti* Rgl. in Tr. Bot. sada, VI (1880) 362. — Ic.: Hiltebr. l. c. tab. 13; Gartenfl. XXXI, tab. 1080 (1882). — Exs.: Herb. Fl. As. Med. No. 207.

Perennial; rhizome 4–10 mm thick, ascending or creeping; stems few, erect or ascending, simple, with short fine hairs, 10–30 cm long; in addition to fertile stems there are bundles of radical leaves; leaves orbicular-cordate or orbicular-reniform, obtuse at apex, with large rounded teeth at margins, 1–4 cm long and nearly as wide, glabrous or very sparingly hairy above, densely pubescent or sometimes finely grayish-tomentose beneath; radical leaves with basally dilated petioles 2–4 times as long as blade; cauline leaves 3 pairs, the lower long-petioled, the middle with petioles as long as blade or shorter, the uppermost pair (at base of inflorescence) with very short petioles; flowers in verticillasters, subsessile, crowded at summit of stem in a dense ovoid inflorescence, one whorl in axils of lower pair of leaves; bracts shorter than calyx, bluish, obovate, cut into ovate-lanceolate or lanceolate aristate lobes, cuneate or entire at base; calyx puberulent outside, 15–18 mm long, obscurely 2-lipped, teeth subequal, lanceolate, aristate, half as long as tube, the upper half as broad again as the others; corolla 25–30 (40) mm long, dark blue, pubescent outside, glabrous within or sometimes with sparse short hairs at base of lower lip; upper lip cut to 1/3 into 2 semiorbicular lobes; lower lip half as long again as the upper, the
454 reniform middle lobe 3–3.5 times as wide as the lateral lobes; style exerted from upper lip, nutlets ovoid, obscurely trihedral, 4 mm long, 2 mm wide. June–July.

Alpine belt, on rocks, taluses, stony and gravelly mountain tundras, old moraines near glaciers, sometimes alpine meadows. — West Siberia: Alt.; East Siberia: Ang.-Say.; Centr. Asia: Dzu.-Tarb., T. Sh., Pam.-Al. (Altai and Turkestan ranges). **Gen. distr.:** Ch. (Sinking). Described from Altai. Type in Leningrad.

11. *D. stellerianum* Hiltebr. Monogr. Dracoceph. (1805) 21, 36, 65. — *D. chamaedryfolium* Turcz. ex Benth. in DC. Prodr. XII (1848) 399. — *D. grandiflorum* β . minus Benth. l. c. 399. — *D. grandiflorum* α . *latifolium* et β . *angustifolium* Ldb. Fl. Ross. III (1846–1851) 386.

Perennial; rhizome ascending, branching above; stems few, ascending at base, puberulent, more densely so in upper part, 6–20 cm long; leaves with patent-hairy petiole shorter than blade, broadly ovate or orbicular, subcordate or truncate or short-cuneate at base, with crenate to obtusely dentate ciliate margins, puberulent or subglabrous on both sides, 1.2–3.5 cm long, 0.8–2 cm wide; floral leaves narrower, less dentate, sometimes entire; flowers short-pedicled, in verticillasters at end of stem forming an oblong inflorescence, sometimes with one remote lower verticillaster; bracts oblong or ovate, entire, long-ciliate,

subulate-pointed at apex; calyx ca. 13 mm long, 2-lipped, middle tooth of upper lip broadly ovate, 2-3 times as broad as the other lanceolate teeth; corolla ca. 30 mm long, densely pubescent outside, azure-blue. June-July.

Stony slopes and taluses in alpine and subalpine belts. — East Siberia: Lena-Kol.; Far East: Okh., Uss. (Dzhugdzhur Range). Endemic. Described from Siberia (between Yakutsk and Okhotsk). Type in Moscow (?).

12. **D. fragile** Turcz. ex Benth. Lab. gen. et sp. (1832-1836) 495; Bge. Suppl. Fl. Alt. 50; Ldb. Fl. Ross. III, 386; Turcz. Fl. baic.-dahur. II, 379. — Ic.: Turcz. in Bull. Soc. Nat. Mosc. XXIV, 4, tab. 8.

Perennial; rhizome long, 3-4 mm thick, ascending, branching above; stems few to many, ascending at base, later erect, covered with soft long spreading hairs, more densely so in upper half; leaves with petioles shorter than blade, ovate, 1-4.5 cm long, 0.5-2 cm wide, obtuse at apex, abruptly or gradually tapering at base, entire or crenate in upper half, subglabrous on upper side, prominently veined beneath, beset with white thickish hairs, the margin with long fine cilia or subglabrous; flowers short-pedicel, in few-flowered verticillasters at summit of stem forming an oblong inflorescence, lower whorls distant; bracts entire, ovate or narrowly ovate, 12 mm long, 4 mm wide, villous; calyx 15-17 mm long, middle tooth of upper lip twice as wide as the lanceolate lateral teeth, all teeth subulate-pointed; corolla 25-30 mm long, whitish-yellowish, lower lip dark blue, with azure spots. July.

Stony and gravelly riverbanks, often on bald peaks. — East Siberia: Yenisei (vicinity of Yeniseisk), Ang-Say., Dau. **Gen. distr.:** Mong. (Lake Khubsugul). Described from Lake Khubsugul (Kosogol). Type in Leningrad.

Note. In his monograph on the genus *Dracocephalum*, Hiltebrandt presents a drawing (No. 10) of *D. grandiflorum*. According to Bunge (Suppl. Fl. Alt., p. 50) the drawing may possibly refer to *D. fragile* Turcz. We have refrained from citing Hiltebrandt's key above because we doubt the accuracy of Bunge's supposition.

13. **D. multicolor** Kom. in Izv. Bot. sada, XVI (1916) 177; Kom. and Alis. Opređ. rast. Dal'nevost. kraya, II, 903.

Perennial; rhizome ascending, to 1.5 cm thick, branching above; stems many, more or less suffused with violet, covered with short retrorse hairs, branching, 10-50 cm long; lower leaves soon withering; middle leaves ovate or ovate-oblong, subcordate or rounded or short-cuneate at base, obtuse at apex, pectinate-dentate with obtuse slightly antrorse teeth, the upper side glabrous, with depressed veins, the lower side white-tomentose, prominently veined; petioles 0.5-1 cm long, hairy on one side; blade 1.5-4 cm long, 0.8-2.5 cm wide; leaves of short axillary shoots smaller; flowers with pedicels 2-3 mm long, in few-flowered verticillasters at end of stem and branches, forming a rather dense oblong inflorescence; bracts obcuneate, gradually tapering to short petiole, sparingly pubescent, at margins with 4 lanceolate teeth terminating in long subulate slightly hairy point, the central tooth broadly ovate, abruptly subulate-pointed; calyx ca. 17 mm long, usually purple-violet, with scattered punctate glands, 2-lipped; middle tooth of upper lip broadly ovate, mucronate, 2-3 times as broad as the other lanceolate acuminate teeth; corolla 35-50 mm long, white-hairy outside, with violet spots on limb; upper lip much longer than the lower. July-August.

456 *Stony slopes and taluses, rocks, sometimes in oak forests. — Far East: Uss. Endemic. Described from Tetyukhe River. Type in Leningrad.*

14. **D. krylovii** Lipsky in Tr. Bot. sada, XXIV, 2 (1905) 121; Kryl. Fl. Zap. Sib. IX, 2331.

Perennial; stems few, woody at base, procumbent or ascending, 15–25 cm long, covered with short retrorse hairs, branching from base with remote short branches, only the upper fertile; leaves glabrous above, dark green, short-hairy beneath, with numerous, very small glands; lower leaves with petiole half as long as blade, broadly ovate, 10–20 mm long, 6–12 mm wide, obtuse, large-toothed or incised, each margin with 3–5 obtuse or rounded antrorse teeth; leaves on branches oblong-elliptic or oblong, much narrower than the cauline; flowers short-pedicel, in 2–5-flowered verticillasters forming a loose inflorescence at the ends of stem and upper branches, 3–4 cm long; bracts 1/5–1/3 as long as calyx, ovate or elliptic, acuminate, entire or the lower with 1 tooth at each side, tapering to petiole at base; calyx ca. 12 mm long, puberulent, with numerous punctate glands; upper lip cut to 2/3 into lobes, the middle lobe ovate, aristate, the lateral lanceolate, aristate, 3–3½ times as broad as middle lobe and slightly shorter; teeth of lower lip lanceolate; corolla 30–35 mm long, azure, covered outside with fine and rather long hairs, hairy within only at base of lower lip; upper lip shallowly cut into semiorbicular lobes; lower lip half as long again, the reniform middle lobe obscurely crenate, 3½ times as broad as lateral lobes. July.

Rocks. — West Siberia: Alt. (Mrassu River near Chelei). Endemic. Described from site indicated. Type in Leningrad.

Subsection 3. *Idiodracontes* Briq. in Pflanzenfam. IV, 3a and 3b (1897) 239, ex parte. — Section *Moldaviae* Benth. Lab. gen. et sp. (1832–1836) 496, ex parte. — Leaves elongate, entire or few-toothed.

Series 1. *Fruticulosa* Schischk. — Floral leaves indistinguishable in shape from cauline leaves.

15. **D. fruticosum** Steph. in Willd. Sp. pl. III (1800) 152; Hiltebr. Monogr. Dracocceph. 29, 65; Ldb. Fl. Ross. III, 386; Turcz. Fl. baic.-dahur. II, 380. — Ic.: Hiltebr. l. c. tab. 3.

457 Perennial; rhizome thick, 5–10 mm in diameter, ascending, dark brown, branching above, woody; stems many, erect, woody in lower part, covered with short retrorse hairs, 15–30 cm long; leaves ovate or lanceolate-ovate, 3-veined, entire or with 1–2 teeth on each margin, subulate-mucronate, covered with short hairs and numerous punctate glands, 6–12 mm long, 2–4 mm wide, abruptly terminating in a subulate point 0.5–1 mm long; abbreviated axillary shoots with smaller leaves; flowers short-pedicel, crowded at ends of stems in the axils of upper floral leaves and forming rather dense inflorescence 1–3 cm long, 1.5–2 cm wide, sometimes with one distant verticillaster below; bracts leaflike, usually much shorter than calyx; calyx violet-tinged, ca. 10 mm long, minutely puberulent,

slightly curved; teeth lanceolate, acuminate, awn-tipped, the upper tooth slightly broader than the others; corolla half as long again as calyx, ca. 15 mm long, densely covered outside with soft white hairs; anthers blackish-purple, slightly exerted from corolla; nutlets dark purple, 3.2 mm long, 1.2 mm wide. Fl. July; fr. August.

Rocks and shrubby thickets. — East Siberia: Ang.-Say., Dau. **Gen. distr.:** Mong. Described from Siberia. Type in Berlin.

16. **D. integrifolium** Bge. in Ldb. Fl. Alt. II (1830) 387; Ldb. Fl. Ross. III, 386; Lipsk. in Tr. Bot. sada, XXVI, 588; Kryl. Fl. Zap. Sib. IX, 2325. — **Ic.:** Ldb. Ic. pl. fl. Ross. II, tab. 120.

Perennial, more or less woody, the divaricately branching stems covered with grayish-brown peeling bark; herbaceous branches erect or ascending, covered with very short appressed retrorse hairs, 15–60 cm long, leaves lanceolate or ovate-lanceolate, acute, sessile or tapering to short petiole, 3-veined, entire or with 1–2 teeth on each margin, glabrous or short-ciliate at margins, 1.5–3 cm long, 3–8 mm wide; abbreviated axillary shoots with smaller leaves; flowers in verticillasters, in threes on short pedicels in axils of upper floral leaves, forming a rather dense inflorescence 2–5 cm long and ca. 2.5 cm wide; bracts slightly shorter than calyx, elliptic, tapering at base, long-acuminate at apex, at sides with 1 pair of filiform lobes 2–3 times longer than width of bracts; calyx short-hairy, often dingy violet, slightly curved, nearly 2-lipped; middle lobe of upper lip broadly obovate or sub-orbicular, aristate, 2–3 times as wide as the lanceolate lateral lobes, these about as long as lobes of lower lip; all calyx-teeth with very prominent transverse anastomoses; corolla bluish-lilac, puberulent outside and at base of lower lip within, 15–18 mm long; upper lip cut to 1/3 into semiorbicular lobes; lower lip half as long again, the middle lobe reniform, emarginate, obtusely crenate at margins, nearly 3½ times as wide as the rounded-ovate lateral lobes; style scarcely exerted from upper lip; nutlets dark brown, obscurely 3-angled, ovoid, 2.5 mm long, ca. 1.5 mm wide. June–July.

Stony, gravelly and grassy slopes, broadleaved forests and thickets at altitudes of 900–2000 m. — West Siberia: Alt. (SW); Centr. Asia: Dzu.-Tarb., T. Sh. **Gen. distr.:** Ch. (Sinkiang). Described from Altai. Type in Leningrad.

Series 2. *Nutantia* Schischk. — Leaves more or less evenly toothed; floral leaves entire.

17. **D. nutans** L. Sp. pl. (1753) 596; Hiltebr. Monogr. Dracoceph. 54, 76; Ldb. Fl. Ross. III, 387; Turcz. Fl. baic.-dahur. II, 381; Lipsk. in Tr. Bot. sada, XXVI, 592; Kryl. Fl. Zap. Sib. IX, 2325. — *D. nutans* var. *alpinum* Kar. et Kir. in Bull. Soc. Nat. Mosc. XV (1842) 424. — *D. alpinum* Turcz. in Bull. Soc. Nat. Mosc. XXIV (1851) 383, non Salisb. — *D. microphyllum* Turcz. l. c. (1851) 384. — *Zornia nutans* Moench, Meth. (1794) 411. — **Ic.:** Pall. Fl. Ross. tab. 115.

Perennial; stems solitary or few or many, simple or branching, puberulent, 20–70 cm long; radical and lower cauline leaves with puberulent petiole longer than blade, ovate, cordate at base, obtuse at apex, obtusely subulate-toothed at margin, 1.5–4 cm long, 1–3 cm wide; middle cauline leaves larger, to 7 cm long, 4 cm wide, oblong-ovate, rounded

at base, the petiole as long as blade or shorter; upper leaves sessile, smaller and narrower, with puberulent blade; flowers short-pedicelated, in many-flowered whorls, these remote, only at summit of stem approximate and forming an inflorescence 4–40 cm long and ca. 2 cm wide; bracts entire, elliptic, acute, tapering toward base, shorter than calyx, puberulent, with ciliate margin; calyx covered with spreading hairs, 6–8 mm long, violet, obscurely 2-lipped, with equal teeth; middle tooth of upper lip broadly ovate or suborbicular, aristate, $2\frac{1}{2}$ –3 times as wide as the other lanceolate finely pointed teeth; corolla bluish-lilac, rarely white (var. *albiflorum* Schischk.), puberulent outside and at base of lower
459 lip within, 17–22 mm long; nutlets dark violet, ovoid, 1.5 mm long, 0.8 mm thick.
June–July.

Pine groves, broadleaved forests, thickets, gravelly, stony, sandy slopes, taluses and pastures, often ascending in mountains onto the subalpine and alpine belts. — European part: Kar.-Lap. (near beds of railroad tracks), Lad.-Ilm., V.-Kama (also), M. V., Transv.; West Siberia: Ob., Alt., Irt.; East Siberia: Ang.-Say., Dau., Lena-Kol.; Far East: Uss., Okh.; Centr. Asia: Balkh., Dzu.-Tarb., T. Sh., Pam.-Al. **Gen. distr.:** Mong., Ch. (Manchuria, Sinkiang). Described from N. Asia. Type in London.

Note. In habit, *D. nutans* L. closely resembles *D. thymiflorum* L., but the root system of *D. nutans* is much stronger, often with a well-developed horizontal rhizome, while *D. thymiflorum* has an annual root; the corolla of *D. nutans* is 17–22 mm long, that of *D. thymiflorum* 7–9 mm; the nutlets of *D. nutans* are smaller, 1.5 mm long and 0.8 mm thick, those of *D. thymiflorum* 2 mm long and ca. 1 mm thick.

Turchaninov thought that the mountain form could be separated into two species, *D. microphyllum* Turcz. and *D. alpinum* (Kar. et Kir.) Turcz., but the enormous amount of material that has since accumulated indicates that, with increasing altitude, the high-mountain form gradually becomes dwarfed and its stems tend to proliferate. Occasionally, however, the low-growing, multicaulescent forms may also occur in lowlands.

18. *D. thymiflorum* L. Sp. pl. (1753) 566; Hiltebr. Monogr. Dracoceph. 57, 77; Benth. in DC. Prodr. XII, 400; Ldb. Fl. Ross. III, 388; Boiss. Fl. or. III, 671; Shmal'g. Fl. II, 353; Kryl. Fl. Alt. IV, 1040; Lipskii in Tr. Bot. sada, XXVI, 591; Kryl. Fl. Zap. Sib. IX, 2327. — *Zornia parviflora* Moench, Meth. (1794) 411. — **lc.:** Pall. Fl. Ross. tab. 114; Syreishch. Ill. fl. Mosk. gub. 91; Hiltebr. l. c. tab. 16.

Annual; stems single or few, simple or branching, with obliquely ascending branches, covered with short retrorse hairs, 20–60 cm long; lower leaves with petiole longer than blade, cordate-ovate, obtusely toothed at margins, subglabrous, 1–3.5 cm long, 0.7–2.0 cm wide; upper leaves oblong-ovate, cuneately tapering to short petiole; flowers short-pedicelated; verticillasters approximate at summit of stem and distant below; inflorescence rather dense, 2–8 cm long, 1.5–2 cm wide, in fruit with remote whorls, reaching 25 (40) cm in length; bracts elliptic, acute, tapering toward base, entire, puberulent, ciliate at margin, shorter than calyx; calyx 7–9 mm long, covered with spreading hairs, obscurely 2-lipped, with equal teeth; middle tooth of upper lip broadly ovate or suborbicular, aristate, 3–4 times as wide as the other lanceolate aristate teeth; corolla bluish-lilac,
460 7–9 mm long; nutlets dark brown, ovoid, 2 mm long, 1 mm wide. May–July.

Thickets, forest margins, birch groves, railroad beds, burned out areas, fallow lands, roadsides. — European part: Kar.-Lap. (introduced), Dev.-Pech. (introduced), V.-Kama,

Ural., Lad.-Ilm. (introduced), Balt., U. Dnp. (Gorki, Mogilevskii region), U. Volga, V.-Don, Transv., Bl., L.V.; Caucasus: Cisc., E. Trans.; West Siberia: Ob., U. Tob., Alt., Irt.; East Siberia: Yenis., Ang.-Say.; Centr. Asia: Ar.-Kasp., Balkh. **Gen. distr.:** Centr. Eur. (introduced), Iran. Described from Siberia. Type in London.

Economic importance. The plant contains about 0.04% essential oil that in no way approaches that produced by *D. moldavica* L.

Subsection 4. *Dolichodracontes* Schischk. subsect. nov. — Stems 10–20 cm long; leaves oblong or broadly ovate, the margin with obtuse and often rounded teeth; petioles much shorter than blade; bracts with long aristate teeth.

Series 1. *Nodulosae* Schischk. — Bracts with teeth terminating in awn 2–4 mm long.

19. ***D. nodulosum*** Rupr. in Mém. Acad. Sc. Pétersb. VII, sér. XIV, 4 (1869) 65; Lipsk. in Tr. Bot. sada, XXVI, 582.

Perennial; rhizome ascending or subhorizontal, branching above, the branches woody in lower part; stems ascending, flexuous or suberect, violet-tinged, especially in lower part, covered with short subpatent to retrorse soft hairs, more densely so in upper half, 10–30 cm long; leaves with petiole slightly shorter than blade, broad-ovate to ovate, obtuse at apex, abruptly cuneate-attenuate or truncate or sometimes obscurely cordate at base, pectinate-dentate with obtuse round-tipped teeth, with veins impressed above and prominent beneath, puberulent on both sides, especially along the veins beneath, 0.6–2 cm long, 0.4–1.5 cm wide; flowers short-pedicel, in verticillasters in the axils of upper leaves; inflorescence ovoid, rather dense, 2–5 cm long, ca. 2 cm wide, the lower verticillasters more or less distant in fruit; bracts obtriangular, with 3–5 lanceolate teeth attenuate to subulate point 2–4 mm long; calyx ca. 10 mm long, obliquely cut at throat, with prominent folds at base of teeth, 2-lipped; middle tooth of upper lip twice as broad as the lanceolate lateral teeth; lower lip with 2 lanceolate teeth; corolla (dry) yellowish-whitish, densely puberulent outside, ca. 15 mm long; nutlets oblong, obscurely 3-angled, pale brown, 3 mm long, 1.2 mm wide. June–July. (Plate XXVII, Figure 3.)

Stony and grassy mountain slopes, taluses and rocks, moraines to altitude of 3300 m. — Centr. Asia: Dzu.-Tarb. (Dzungaria Ala-Tau), T. Sh., Pam.-Al. **Gen. distr.:** Ch. (Sinkingiang). Described from T. Sh. (Dzhaman-Daban pass). Type in Leningrad.

20. ***D. oblongifolium*** Rgl. in Izv. Obshch. Lyub. est. antr. i etn. XXXIV, 2 (1882) 67; Lipsk. in Tr. Bot. sada, XXIII, 204. — *D. crenatifolium* Franch. in Ann. Sc. Nat. sér. VI, XXIII (1884) 233. — *D. oblongifolium* var. *usun-achmati* Lipsky, op. cit. XXIV (1906) 606. — **lc.:** Franch. l. c. tab. 16.

Perennial; rhizome 7–10 mm thick, ascending, strongly branching above; stems numerous, ascending at base, very densely covered with short, grayish hairs, branching in lower part, 10–20 cm long; leaves sessile or with very short petiole, broadly ovate to suborbicular, subcordate or orbicular or cuneate at base, 1–2 cm long, 0.5–1 cm wide, the margins crenate-dentate with obtuse teeth, often revolute; flowers short-pedicel, in few-flowered verticillasters at ends of stems and branches forming a capitate inflorescence; lower floral

leaves resembling the cauline, the upper cuneate, almost flabelliform round-toothed at apex; bracts entire, narrowly lanceolate or linear, long-acuminate, villous-hairy at margins, shorter than calyx; calyx pubescent, 12–13 mm long, the teeth lanceolate, spiny-acuminate, all equal in length, the middle tooth of upper lip slightly broader than the lateral teeth; corolla villous outside, dark blue, ca. 25 mm long, the lower lip longer, the upper lip glabrous inside. July–August.

Stony slopes in alpine and subalpine belts at altitudes to 3300 m. — Centr. Asia: Pam.-Al., T. Sh. (western). Endemic. Described from Kadzhrag pass on Yagnob Range. Type in Leningrad.

21. *D. scrobiculatum* Rgl. in Izv. Obshch. lyub. estestv. antr. i etn. XXXIV, 2 (1882) 67; Lipsk. in Tr. Bot. sada, XXIII (1904) 206.

Perennial; rhizome ascending, ca. 1 cm thick, branching above; stems numerous, ascending, almost woody in lower part; herbaceous stems densely covered with soft white hairs, 10–20 cm long; leaves oblong, obtuse, 1–3 cm long, 4–7 mm wide; the lower with short pubescent dilated petiole, the upper sessile, obtusely pectinate-dentate, often with involute teeth, the lower side with very prominent veins often forming a reticulate-pitted 462 pattern, sparingly pubescent; the upper side subglabrous; flowers at summit of stem in few-flowered verticillasters forming oblong inflorescence, with the lower whorls often remote; bracts ovate- or oblong-cuneate, half as long as calyx, awned at apex and usually with 2 aristate lateral teeth, ciliate at margin, slightly hairy above; calyx 20 mm long, pubescent, often violet-tinged, the teeth equal, short-awned; middle tooth of upper lip elliptic-lanceolate, nearly twice as broad as others; corolla straw-colored (?), 40 mm long, hairy outside, lower lip longer than the upper. June–August. (Plate XXVI, Figure 1.)

Stony slopes in alpine belt at altitudes of 2100–3300 m. — Centr. Asia: Pam.-Al., T. Sh. (Western). Endemic. Described from Kadzhrag pass on Yagnob Range. Type in Leningrad.

Subsection 5. *Stenodracontes* Briquet in Pflanzenfam. IV, 3a and 3b (1897) 240. — Calyx 2-lipped; upper lip cleft to $1/4$ – $1/3$, its 3 teeth subequal, ovate; lower lip cleft to $1/4$ or nearly to base.

Series 1. *Foetidae* Schischk. — Annuals; lower leaves on petioles equal to or shorter than blade.

22. *D. foetidum* Bge. in Ldb. Fl. Alt. II (1830) 386; Benth. in DC. Prodr. XII, 401; Kryl. Fl. Zap. Sib. IX, 2329. — *D. moldavica* β . *asiaticum* Hillebr. Monogr. Dracoeceph. (1895) 43; Ldb. Fl. Ross. III, 388; Turcz. Fl. baic.-dahur. II, 382. — *D. moldavicum* var. *foetidum* Palib. in Tr. Bot. sada, XIV (1895) 136. — Ic.: Ldb. Ic. pl. fl. Ross. II, tab. 143.

Annual; stems reddish, short-hairy, usually branching from base, 5–15 cm long; leaves with petiole nearly as long as blade, ovate or oblong-ovate, puberulent, on lower side also with punctate glands, obtuse, round-toothed, truncate or rounded at base, 0.5–1.5 cm long,

0.3–0.8 cm wide; upper leaves short-petioled, tapering to base; flowers short-pedicel; verticillasters 6-flowered at the end of stem, the lower distant, the upper approximate; bracts pubescent, oblong or oblong-obcuneate, gradually tapering to short petiole, with 3–5 awned teeth, the awn long, slender, half as long again as bract width; calyx 8–9 mm long, 2-lipped, upper lip cut to 1/3 into broadly ovate lobes, the teeth of lower lip lanceolate, all calyx lobes aristate; corolla pale lilac, 15–18 mm long, hairy outside and at base of lower lip. July–August.

463 Slopes of sandy and clayey hills, in sandy and pebbly steppes. — West Siberia: Alt., Ang.-Say., Dau. **Gen. distr.:** Mong. Described from Chuya “steppe.” Type in Leningrad.

23. **D. moldavica** L. Sp. pl. (1753) 595; Benth. in DC. Prodr. XII, 401; Ldb. Fl. Ross. III, 383; Shmal'g. Fl. II, 325; Lipskii in Tr. Bot. sada, XXVI, 577; Kryl. Fl. Zap. Sib. IX, 2328. — *D. moldavicum* α. *europaeum* Hiltebr. Monogr. Dracoceph. (1805) 43. — *Moldavica punctata* Moench, Meth. (1794) 410. — *M. suaveolens* Gilib. Fl. Lithuan. I (1782) 79.

Annual; stem erect, 15–50 cm long, puberulent, branching from base, the branches long, obliquely ascending, nearly reaching the summit of stem; leaves with petiole 1/2–2/3 as long as blade, covered with short hairs, oblong-ovate or oblong-lanceolate, with obtusely toothed margin, truncate or cuneately tapering at base, short-hairy, 1.5–3 cm long, 0.7–1.8 cm wide; flowers short-pedicel; verticillasters 6-flowered, approximate in upper part, distant below; floral leaves oblong-cuneate, with long slender awned points in lower half; bracts 8–10 mm long, oblong-obcuneate, with 4–6 long-awned teeth beset with short sparse hairs; calyx 9–11 mm long, short-hairy, 2-lipped; upper lip cut to 1/3 into 3 broadly ovate subulate-pointed teeth; lower lip with 2 oblong-lanceolate, subulate-pointed teeth; corolla 20–25 mm long, white or bluish violet, hairy outside. July–August.

Cultivated in kitchen gardens mainly in the southern parts of the USSR, often occurs as a weed. — European part: Balt., U. Dnp., M. Dnp., V.-Don, L. Don, L.V., Bes., U. Dns.; West Siberia: Ob, Irt.; East Siberia: Ant.-Say., Dau.; Far East: Uss.; Centr. Asia: Pam.-Al., Kara K. **Gen. distr.:** Centr. Eur. (?), China (?), Himalayas. Described from Moldavia. Type in London.

Economic importance. The plant was grown in the past for its nectar and in some places apparently as a substitute for tea. It is now cultivated for its essential oil. The oil is present in all parts of the plant which is harvested before flowering and distilled with water vapor. The oil yield is 0.01 to 0.17%, the major components being citral (25–68%), geraniol (30%), nerol (7%), and others. Citral is used in manufacture of fruit juices and in the perfume industry.

Series 2. *Peregrinae* Schischk. — Perennials; leaves with petiole much shorter than blade; bracts with 1–3 aristate teeth at each side.

464 24. **D. peregrinum** L. Cent. pl. II (1756) 20; Hiltebr. Monogr. Dracoceph. 37, 69; Ldb. Fl. Ross. III, 389; Lipsk. in Tr. Bot. sada, XXVI, 584; Kryl. Fl. Zap. Sib. IX, 2330. — *D. stellerianum* Steud. ex Benth. in DC. Prodr. XII (1848) 402, non Hiltebr. — *D. politovii* Gand. in Bull. Soc. Bot. Franc. LXV (1918) 65. — ? *Ruyschiana verticillata*

Mill. Gard. Dict. ed. VIII (1759) No. 3. — **Ic.**: Hiltebr. l. c. tab. 8; Pall. Fl. Ross. tab. 117. — **Exs.**: Smirn. Pl. alt. exs. No. 73.

Perennial; rhizome thick, woody; stems few, erect or ascending, branching from base with long spreading branches, covered with short retrorse stiff hairs, 20–70 cm long; lower leaves with petiole nearly as long as blade, glabrous, ovate-lanceolate or lanceolate, acuminate, rounded at base, dentate at margins with spiny-tipped teeth (the slender spine nearly as long as the teeth) rarely entire, 1–3.5 cm long, 0.3–1 cm wide; upper leaves short-petioled, covered beneath with short stiff hairs, often entire; flowers short-pedicel, in remote verticillasters at summit of stem forming loose 1-sided inflorescences 5–15 cm long; bracts short-petioled, shorter than calyx, elliptic or elliptic-lanceolate, resembling floral leaves but with fewer teeth, these with longer points (rarely bracts entire); calyx short-hairy, 2-lipped, 13–15 mm long; upper lip cut to 1/3 into subequal broad-ovate aristate lobes; lower lip cut to 3/4 into lanceolate aristate lobes twice as long as those of upper lip; corolla pale bluish-lilac or dark blue, sometimes pink or white, 27–32 mm long, pubescent outside, lanate within only on upper lip, this cut to 1/4 into broadly ovate lobes; lower lip half as long again as the upper, the obreniform emarginate middle lobe 3 times as broad as the lateral lobes; nutlets pale brown, trigonous-ovoid, 4 mm long, 2 mm wide. Fl. June–August; fr. September.

Stony and gravelly slopes, rocks; ascending in mountains to alpine belt. — West Siberia: Ob (very rarely), Alt.; East Siberia: Ang.-Say.; Centr. Asia: Dzu.-Tarb. **Gen. distr.**: Ch. (Sinkiang), Mong. Described from Siberia. Type in London.

25. **D. bipinnatum** Rupr. in Mém. Acad. Sc. Pétersb. VII sér., XIV (1869) 66; Lipsk. in Tr. Bot. sada, XXVI, 595. — **D. ruprechtii** Rgl. in Tr. Bot. sada, VI (1880) 563; Hook. Fl. of Brit. Ind. IV, 666. — **D. ruprechtianum** Rgl. in Gartenfl. XXIX, tab. 1018 (1880). — **Ic.**: Rgl. in Gartenfl. l. c. — **Exs.**: Ed. Horti bot. Petri Magni, No. 88.

- 465 Perennial; rhizome ascending, 5–10 mm thick, slightly branching above; stems numerous, woody at base, erect or ascending, sometimes suffused with purple, minutely puberulent or subglabrous, branching or simple, 20–50 cm long; leaves subglabrous, simply pinnate or the upper bipinnate, with linear or lanceolate lobes 0.5–2 cm long and 1–2 mm wide, acute, with revolute margins, the abbreviated shoots in their axils with smaller leaves; flowers short-pedicel, in few-flowered verticillasters, these more or less distant and forming an elongate terminal inflorescence; floral leaves pinnatisect, the short lobes often terminating in a long awnlike point; calyx 15–20 mm long, slightly purple-tipped, puberulent, 2-lipped; upper lip cut to 1/4–1/3 into triangular teeth abruptly terminating in awn-shaped point ca. 1 mm long, with very prominent obliquely transverse anastomoses; corolla dark violet (azure), 30–40 mm long, short-villous outside; nutlets pale brown, obscurely compressed-trigonus, 4 mm long, 2 mm wide, with prominent lateral edges. July. (Plate XXVI, Figure 3.)

Steppe, semidesert and gravelly slopes, stony banks of mountain streams. — Centr. Asia: T. Sh., Pam.-Al. **Gen. distr.**: Ch. (Sinkiang). Described from Tien Shan. Type in Leningrad.

26. **D. heterophyllum** Benth. Lab. gen. et sp. (1836) 738; Benth in DC. Prodr. XII, 401; Hook. Fl. of Brit. Ind. IV, 695; Lipsk. in Tr. Bot. sada, XXVI, 597. — **D. kaschgabricum** Rupr. in Mém. Acad. Sc. Pétersb. VII sér. XIV, 4 (1869) 65. — **D. gobi** Krassn. in

Zap. Russk. geogr. obshch. XIX (1888) 340 and in Bot. zap. II (1889) 19. — *D. gobianum* Krassn. ex Lipsky in Tr. Bot. sada, XXVI (1909) 598, nom. *D. batalini* Krassn. in Sched. herb. ex Lipsky, l. c. — *D. pamiricum* Briq. in Bot. Tidskr. XXVIII (1907) 239.

Perennial; rhizome 2–5 mm thick, horizontal or ascending, slightly branching above; stems few, the central erect or wanting, the lateral procumbent, densely puberulent, faintly purple-tinged, 5–18 cm long; lower leaves with purple petioles 2.5–3 cm long, subreniform or broadly ovate, cordate at base, rounded at apex, 1.2–2.5 cm long, 2–2.5 cm wide, puberulent on both sides, sometimes subglabrous, with prominent veins and numerous punctate glands beneath, the margins shallowly, sometimes obscurely, crenate-dentate with obtuse teeth; flowers short-pedicel; verticillasters few-flowered, at the end of stem and branches, forming an oblong inflorescence 2–10 cm long, 3–5 cm wide; bracts broadly
466 obcuneate, pubescent, in lower half with triangular-lanceolate teeth terminating in a long awn; calyx 14–20 mm long, puberulent, 2-lipped; upper lip cut to 1/3 into 3 triangular teeth equal in width and terminating in a short subulate point; teeth of lower lip narrowly lanceolate, subulate-acuminate; corolla ca. 25 mm long, yellowish-white, hairy outside. July–August.

Stony beds of mountain streams, pebbles, stony, clayey and sometimes sandy mountain slopes at altitudes of 2400–4100 m. — Centr. Asia: T. Sh., Pam.-Al. **Gen. distr.:** Ch. (Sinkiang), Ind.-Him. Described from the Himalayas. Type in London.

27. *D. diversifolium* Rupr. in Mém. Acad. Sc. Pétersb. VII sér., XIV, 4 (1869) 66; Lipsk. in Tr. Bot. sada, XXVI, 586. — Exs.: HFAM, No. 206.

Perennial; rhizome long, to 1.5 cm thick, ascending, strongly branching above; stems few, 20–40 cm long, covered with very short hairs, branching, with opposite or alternate branches, rarely simple; leaves ovate, crenate-dentate or ovate-lanceolate, entire, obtuse or acute above, tapering to base, abruptly short-petioled, 2–4 cm long, 1–1.5 (2) cm wide, the abbreviated shoots in their axils with smaller, usually entire leaves ca. 1 cm long, 0.4 cm wide; flowers in axils of upper elliptic or lanceolate leaves in remote or approximate many-flowered verticillasters; calyx 15 mm long, covered with very short hairs, 2-lipped, with aristate teeth; upper lip with 3 ovate teeth 1/3–1/2 as long as the lanceolate teeth of lower lip; bracts lanceolate or ovate, with 4 lanceolate teeth at either side, the teeth with slender awn 4–5 mm long, the terminal tooth broadly ovate, with shorter awn; corolla (dry) straw-colored, sometimes bluish, densely covered with soft white hairs, ca. 30 mm long; nutlets pale brown, trigonous, 4 mm long, 2.2 mm wide. July–August. (Plate XXVII, Figure 1.)

Stony and gravelly slopes, taluses, sometimes in mountain scrub at altitudes of 1500–4000 m. — Centr. Asia: T. Sh., Pam.-Al. Endemic. Described from Tien Shan. Type in Leningrad.

28. *D. spinulosum* M. Pop. in Izv. Turkest. otd. Russk. Geogr. obshch., XVII (1924) 28. — **lc.:** *ibid.*, Plate 4.

Perennial; rhizome abbreviated, 1–2.5 cm thick, branching above; stems numerous, faintly violet-tinged in lower part, short-hairy, whitish and glabrous in upper part, 15–
469 25 cm long, divaricately branching from base; lower leaves marcescent; middle leaves broadly ovate, obtuse, coarse, 1.5–3.5 cm long, 1–2.5 cm wide, scabrous-hairy on both

(467)

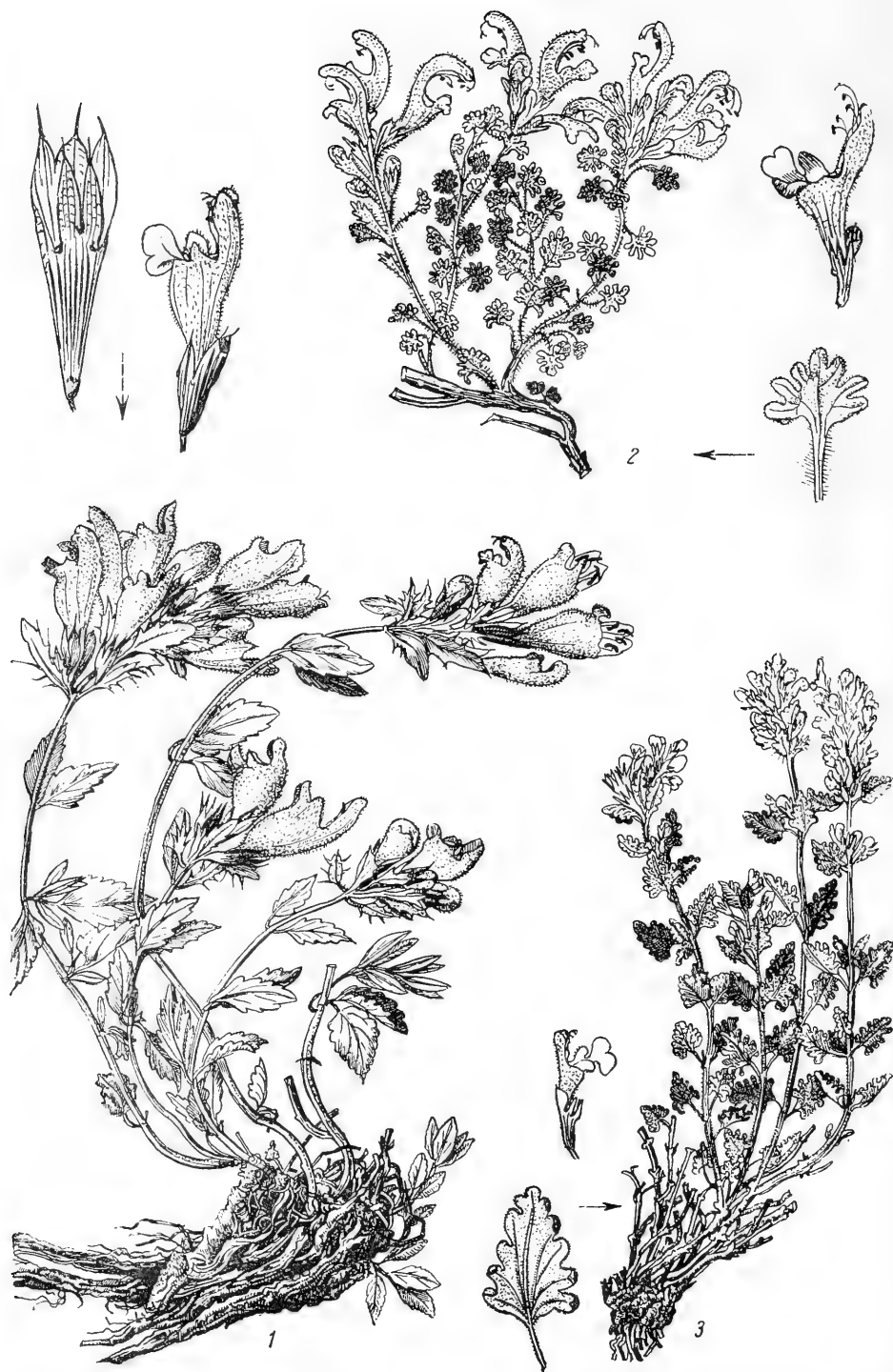


PLATE XXVII. 1 – *Dracocephalum diversifolium* Rupr., general aspect, calyx, flower; 2 – *D. palmatum* Steph., part of plant, leaf, flower; 3 – *D. nodulosum* Rupr., general aspect, leaf, flower.

sides (more densely beneath), with broadly triangular subulate-pointed teeth at margin, subcordate at base; upper leaves sessile, truncate or cuneate at base, the triangular teeth terminating in subulate point 1–3 mm long; petioles very short; flowers subsessile, in 2–6-flowered verticillasters at end of stem and branches, approximate in upper part of inflorescence, subremote below; bracts elliptic, short-petioled, with 4–7 teeth terminating in long subulate point, this equaling width of bracts; calyx 18–20 mm long, scabrous-hairy, sharply 2-lipped; upper lip cut to $1/4$ – $1/3$ into 3 ovate-lanceolate subulate-pointed teeth; lower lip cut nearly to base into 2 lanceolate finely pointed teeth; corolla 20–25 mm long, pubescent outside, whitish or pale brick-red. July–August.

Stony slopes. — Centr. Asia: T. Sh. (western). Endemic. Described from Greater Chimgan. Type in Tashkent.

Series 3. *Komarovianae* Schischk. — Perennials; leaves broadly ovate, cordate at base; bracts not aristate; calyx densely villous.

29. *D. komarovii* Lipsky in Tr. Bot. sada, XXIII (1904) 207.

Perennial, grayish-green all over with dense pubescence; rhizome 2–3 cm thick, dark brown, ascending, branching above; stems numerous, procumbent or ascending, 10–15 cm long; leaves short-petioled, broadly ovate, cordate at base, 7–14 mm long, 5–14 mm wide, crenate or almost entire, covered with many punctate glands and some shining glandular secretions; upper leaves ovate, obtuse; flowers in 2-flowered remote verticillasters; bracts similar to leaves; calyx 10–13 mm long, covered with soft white hairs and remote glandular secretions, 2-lipped; lower lip with 2 lanceolate teeth; upper lip with 3 shorter teeth, these acute but not aristate; corolla straw-colored, 22–25 mm long, covered outside with soft retrorse hairs and scattered glandular secretions; corolla-tube more or less inflated in upper half; upper lip 2-lobed, the lobes ovate; lower lip 3-lobed, with larger middle lobe and 2 short obtuse lateral lobes. June–July.

470 Stony slopes and taluses at altitudes up to 3600 m. — Centr. Asia: Pam.-Al., T. Sh. (western). Endemic. Described from Putkhin and other areas. Type in Leningrad.

Series 4. *Multicaulia* Schischk. — Perennials; leaves ovate, cuneately tapering at base or lanceolate; bracts long-aristate; calyx puberulent.

30. *D. multicaule* Montbr. et Auch. in Ann. Sc. Nat. sér. 2, VI (1836) 47; Boiss. Fl. or. III, 672; Grossg. Fl. Kavk. III, 297.

Perennial; rhizome woody, to 1.5 cm thick, branching above; stems many, densely puberulent, simple or branching, with slender obliquely ascending branches, 15–30 cm long; lower leaves marcescent; middle cauline leaves ovate or lanceolate, 1.5–2 cm long, 0.3–0.7 cm wide, entire, appressed-puberulent, acute or obtuse at apex, tapering at base to short petiole, often conduplicate; flowers in 2-flowered verticillasters forming a loose oblong terminal inflorescence; bracts shorter than calyx, entire, ovate or lanceolate, with long subulate point reaching 3–4 mm in length; calyx short-hairy, 15 mm long, upper lip cut to $1/3$ into ovate-triangular teeth, lower lip cut to $1/4$ into ovate-triangular teeth, all teeth with long subulate point; corolla straw-colored, hairy outside, 25–30 mm long. July.

Stony mountain slopes. — Caucasus: Dag., E. and S. Transc. **Gen. distr.:** As. Min., Arm.-Kurd., Iran. Described from Asia Minor. Type in Paris.

31. **D. subcapitatum** (Ktze.) Lipsky in Tr. Bot. sada, XXVI (1909) 585. — *D. multi-caule* Montbr. et Auch. var. *subcapitatum* O. Ktze. in Tr. Bot. sada, X (1887) 226. — Exs.: HFAM, No. 209.

Perennial; rhizome woody, branching; stems numerous, appressed-pubescent, simple or branching, with short, obliquely ascending branches, 10–25 cm long; lower leaves ovate-elliptic, obtuse, tapering to petiole nearly as long as blade, blade 0.7–1 cm long, 0.5–1 cm wide; middle and upper leaves ovate or oblong-ovate, 1–1.5 cm long, 0.2–0.7 cm wide, obtuse above, abruptly tapering to base, puberulent, with numerous punctate glands; flowers in few-flowered verticillasters at end of stem and sometimes of upper branches, forming a loose oblong inflorescence 5–7 cm long, 2–3 cm wide; bracts narrowly lanceolate or ovate, entire, commonly long-aristate (the awn to 5 mm); calyx 14–16 mm long, puberulent and with lustrous punctate glands, 2-lipped; upper lip cut to 1/3 into ovate
471 teeth, the middle tooth slightly broader than the lateral; lower lip cut only to the middle into 2 teeth; all teeth mucronate; corolla light staw-colored (?), 20–30 mm long, densely covered outside with soft hairs; nutlets oblong-ovate, nearly trigonous, 4 mm long, 1.8 mm wide. Fl. May–June; fr. July–August.

Stony slopes and rocks. — Centr. Asia: Mtn. Turkm. **Gen. distr.:** Iran. Described from Germab. Type in Leningrad.

Economic importance. The plant contains at flowering up to 3% essential oil (on absolute dry weight basis) which is sulfur-yellow, smells of octyl alcohol and could be of use in the perfume industry. An experiment to cultivate *D. subcapitatum* (Ktze.) Lipsky in the Botanical Garden of the Botanical Institute of the Academy of Sciences of the USSR proved successful.

Subgenus 2. **Ruyschiana** (Mill.) Benth. in DC. Prodr. XII, 402; Briq. in Pflanzenfam. IV, 3a and 3b (1897) 240. — Gen. *Ruyschiana* Boehrd. ex Mill. Gard. Dict. ed. VII (1759). — Anthers villous; stem erect, leafy; abbreviated axillary shoots with smaller leaves; verticillasters in leafy terminal inflorescences.

Series 1. *Euruyschiana* Briq. l. c. 240. — Leaves linear-lanceolate, entire.

32. **D. argunense** Fisch. ex Link, Enum. Hort. berol. II (1822) 118; Benth, in DC. Prodr. XII, 402. — *D. ruyschiana* var. *speciosum* Ldb. Fl. Ross. III (1848) 390; Turcz Fl. baic.-dahur. II, 384. — *Ruyschiana speciosa* Ldb. ex Gartenfl. XXIX (1880) 376. — Ic.: Gartenfl. l. c.; Kom. and Alis. Opred. rast. Dal'nevost. kraya, II, Plate 273, 2, 4–7.

Perennial; rhizome woody, short; stems solitary or few, erect or ascending, simple or branching, covered with short appressed hairs or subglabrous, 30–50 cm long; leaves lanceolate-linear, 3–6 cm long, 0.3–0.6 cm wide, with revolute margins, glabrous, the abbreviated densely leafy shoots in their axils with smaller and narrower leaves; flowers in approximate verticillasters forming an ovoid terminal inflorescence 4–7 cm long and

3–4 cm wide, bracts broadly oval or oblong-lanceolate, acute at apex, ciliate at margins; calyx 15–17 mm long, finely pubescent at base, with very prominent nerves and convex folds at base of teeth, these lanceolate, finely pointed, obscurely ciliate; corolla 30–40 mm long, azure-blue, puberulent, the lower lip with few spots; anthers white-tomentose. July.

Sandy meadows, stony slopes, shrubby thickets. — East Siberia: Dau., Lena-Kol.; Far East: Ze.-Bur., Uss. **Gen. distr.:** Ch. (Manchuria), Korea. Described from Argun River. Type in Berlin.

- 472 33. *D. ruyschiana* L. Sp. pl. (1753) 595; Hiltebr. Monogr. Dracoceph. 33, 66; Turcz. Fl. baic.-dahur. II, 383; Boiss. Fl. or. IV, 673; Shmal'g. Fl. II, 324; Grossg. Fl. Kavk. III, 297. — *D. ruyschiana* var. *vulgare* Ldb. Fl. Ross. III (1846–1848) 389. — *Ruyschiana spicata* Mill. Gard. Dict. ed. VIII (1759) No. 4. — *Zornia linearifolia* Moench, Meth. Suppl. (1802) 139. — **Ic.:** Hiltebr. l. c. tab. 6; Syreishch. Ill. Fl. Mosk. gub. 91. — Exs.: GRF, No. 580, 3468; Pl. Finl. exs. No. 890, 891.

Perennial; rhizome branching; stems few, erect, short-hairy mainly under nodes or subglabrous, 20–60 cm long; leaves lanceolate-linear or sublinear, obtuse at apex, entire, with revolute margins, the lower short-petioled, the others sessile, glabrous, dark green above, paler beneath, with punctate glands, 2–6 cm long, 0.2–0.8 cm wide, the abbreviated axillary shoots with narrower leaves; flowers short-pedicel; verticillasters 6-flowered, forming an oblong inflorescence 3–5 cm long at end of stem, the lower whorls sometimes distant; bracts ovate-lanceolate or lanceolate, acuminate, tapering at base, entire, ciliate, equaling or shorter than calyx, short-hairy, 8–11 mm long, obscurely 2-lipped; middle tooth of upper lip ovate, 1½–2 times as broad as the lanceolate lateral teeth; lower lip with similar teeth, all teeth acuminate; corolla violet-blue or dark azure, rarely pink, 20–28 mm long, soft-hairy outside, lanate within only on upper lip; anthers lanate; nutlets black, ovoid, 2.5 mm long, 1.5 mm wide, obscurely trigonous. June–July.

Rock crevices, limestone slopes, sandy ravines, thinned out forests and their margins, meadows and steppes, wastelands. — European part: Kar.-Lap., Dv.-Pech. (rarely), Lad.-Ilm., Balt., V.-Kama, U. Dnp., U. V., Transv., V.-Don, M. Dnp., L. Don, Bl. (very rarely), U. Dns.; Caucasus: Cisc., W., E. and S. Transc.; West Siberia: all regions; East Siberia: all regions; Centr. Asia: Ar.-Casp., Balkh., Dzu.-Tarb., T. Sh. **Gen. distr.:** Scand., Centr. Eur. (?), Mong., Ch. (Manchuria). Described from Siberia and Sweden. Type in London.

Economic importance. The plant contains about 0.4% essential oil which in no way resembles the oil yielded by *D. moldavica* L.

Series 2. *Austriaca* Briq. in Pflanzenfam. IV, 3a and 3b (1897) 240. — Developed leaves 3–5-partite, with linear revolute-margined lobes.

34. *D. austriacum* L. Sp. pl. (1753) 595; Hiltebr. Monogr. Dracoceph. 36, 68; Ldb. Fl. Ross. III, 390; Bois. Fl. or. IV, 673; Shmal'g. Fl. II, 324; Grossg. Fl. Kavk. III, 297.
473 — *Ruyschiana laciniata* Mill. Gard. Dict. ed. VIII (1759) No. 2. — *Zornia partita* Moench, Meth. Suppl. (1802) 139; Steud. Nomencl. bot. (1841) 285. — **Ic.:** Hiltebr. l. c. tab. 7; Jacq. Ic. rar. tab. 112.

Perennial; rhizome branching; stems solitary or few, erect, downy-villous, 20–60 cm long; leaves with puberulent petioles, 3–5 (rarely 7)-partite, with linear or lanceolate lobes, 2–3 cm long, 1–2.5 mm wide, shortly subulate-pointed from obtuse apex, usually with revolute margins, more or less pubescent; leaves on the abbreviated axillary shoots glabrous, entire or 3-partite, linear, acute, 1.5–2 cm long, 1–2 mm wide; flowers short-pedicelled, verticillasters 2–4-flowered, forming a somewhat loose oblong terminal inflorescence; bracts villous-ciliate at margins, trifid; calyx villous, ca. 8 mm long, the middle tooth of upper lip ovate, acute, other teeth linear-lanceolate, acuminate; corolla dark violet, 35–40 mm long, covered with soft hairs; upper lip suberect, ca. 1 cm long; lower lip 3-lobed, nearly equaling the upper; nutlets 3 mm long, with 2 winglike ribs. June–July.

Calcareous and stony slopes, steppe and subalpine meadows to altitude of 2400 m. — European part: U. Dns., M. Dnp.; Caucasus: Cisc., Dag., W. Transc. (Abkhazia), E. Transc. **Gen. distr.:** Centr. Eur. (rarely), Bal.-As. Min. (Balkan and Pontus ranges). Described from Austria. Type in London.

Subgenus 3. **Fedczengiella** (Gontsch.) Schischk. — Gen. *Fedczengiella* Gontsch. in sched. ad Herb. Inst. bot. nom. V. Komarovii Ac. Sc. USSR. — Calyx 2-lipped; stamens long-exserted.

35. **D. stamineum** Kar. et Kir. in Bull. Soc. Nat. Mosc. XV (1842) 423; Benth. in DC. Prodr. XVII, 398; Ldb. Fl. Ross. III, 384; Lipsk. in Tr. Bot. sada, XXVI, 602. — *D. pulchellum* Briq. in Bot. Tidsskr. XXVIII (1908) 241. — **Ic.:** Schweitzer in Potfüz Termeszt. Kozl. XLVI, 66; Briq. l. c. fig. 4.

Perennial; rhizome ascending, 3–5 mm thick, branching above; stems many, ascending or procumbent, minutely puberulent, often violet-tinged, simple or branching, 7–30 cm long; lower leaves with petiole usually exceeding the blade; middle leaves with petiole as long as blade; upper leaves with shorter petiole; blade orbicular-cordate, with rounded teeth, densely covered on both sides with gray hairs, 5–15 mm long and as wide, the frequently produced abbreviated axillary shoots with smaller leaves; flowers short-pedicelled; verticillasters in axils of floral leaves, forming a dense inflorescence at summit of stem or the lower verticillasters subremote; bracts ovate, entire or with 1–2 teeth, as long as pedicel, densely hairy; calyx densely white-hairy, 6 mm long, 2-lipped, the upper lip cut to 1/3 into ovate-triangular teeth, the lower lip cut nearly to base into 2 lanceolate teeth, all teeth with mucro 0.5–1 mm long; corolla dark blue, 10–11 mm long, white-hairy outside; corolla-tube slightly widening above, twice as long as corolla [?]; nutlets ovoid-trigonal, 2 mm long, 1 mm wide. July–August.

Ancient moraines, sandy-stony slopes, taluses, riverbed pebbles, to altitude of 4000 m. — Centr. Asia: Dzu.-Tarb., T. Sh., Pam.-Al. **Gen. distr.:** Ch. (Sinkiang), Ind.-Him. Described from Dzungaria Ala-Tau (Sarkhan). Type in Leningrad.

Note. The species *D. pulchellum*, described by Briquet from Pamir, is unacceptable as the only distinguishing feature indicated by the author (short stamens) is fortuitous. Many of the well developed specimens of this species from Pamir have stamens that are twice as long as the corolla, an observation reported earlier by Lipskii (op. cit.).

Genus 1257.* **Kudrjaschevia**** Pojark.

Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 275.

Calyx tubular-campanulate, straight, 2-lipped, without hairy ring inside; corolla with curved tube gradually widening above into neck; upper lip erect, 2-lobed, with a recurved lobulelike extension at each side; throat narrow; lower lip diverging from the upper at an acute angle, deeply 3-lobed, the lateral lobes turned forward, spreading, the middle lobe broader than long, tapering toward base; upper stamens arcuately ascending under upper lip of corolla; anthers normal, anther-cells divergent at an angle of 180°, not confluent; filaments attached at base of upper lip; lower stamens inserted at base of the dilated part of tube and often included in it, rarely exserted from throat, showing (in different species) various degrees of reduction culminating in transformation into true staminodes; nutlets elliptic; flowers in verticillasters forming a capitate terminal inflorescence or in axils of more or less remote cymes. Perennials (sometimes subshrubs) and annuals.

Four Central Asian species.

- 1. Perennials or subshrubs, with ovate leaves; flowers in capitate terminal inflorescences or in short-peduncled cymes disposed in axils of approximate upper leaves 2.
- 475 + Annuals, with narrow lanceolate leaves; flowers in many remote long-peduncled cymes 4. **K. jacubi** (Lipsky) Pojark.
- 2. Flowers in subsessile, 3 (1-2)-flowered cymes in axils of several pairs of upper leaves; at least 1-2 pairs of lower leaves indistinguishable in shape and size from cauline leaves 3. **K. nadinae** (Lipsky) Pojark.
- + Flowers grouped at the end of elongate upper internode of stem and of axillary branches in small hemispherical dense capitate inflorescences (formed by 1 to several verticillasters), with small bracteiform sheathing leaves (series *Allotrichae*) 3.
- 3. Leaves stiff, to 13 mm long, gray, with uninterrupted coat of simple eglandular hairs; stems and parts of inflorescence with similar indument; head at summit of stem 20-50-flowered 1. **K. allotricha** Pojark.
- + Leaves thin, delicate, pale green; stems, leaves and parts of inflorescence beset on both sides with small sessile capitate glands forming a yellowish bloom; head at apex of stem 10-15-flowered 2. **K. korshinskyi** (Lipsky) Pojark.

Series 1. *Allotrichae* Pojark. — Flowers in semiverticels at the end of the elongate terminal internode of stem and of axillary branches in a dense small head subtended by small bracteiform sheathing leaves; lower stamens with very slender and short filaments, the anthers 1/3-1/2 as large as those of upper stamens (usually producing pollen, included in throat or slightly exserted). Perennials. The series consists of two species.

* Treatment by A.I. Poyarkova.
** Named for the late Tashkent botanist S.N. Kudryashev, author of a monograph on various genera of Labiatae.

1. *K. allotricha* Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, V (1953) 277. — *Nepeta korshinskyi* Lipsky in Tr. Bot. sada, XXIII (1904) 502, p. p. quoad pl. shugnan. — Ic.: Poyark., op. cit. Fig. 1.

476 Perennial; sometimes subshrub; root woody, thick, more or less twisted, longitudinally splitting; stems numerous from woody branching base, reclinate and partly procumbent, often arched, branching, with internodes (except lower) 5–11 cm long, densely villous-hairy, the hairs very short, simple, mostly unicellular, sparsely intermixed with short-stipitate and sessile capitate glands; lower axillary branches long, sparingly leafy, terminating in inflorescence; leaves firm (in herbarium rigid), horizontally spreading, greenish-gray, densely covered with very short appressed simple hairs, oblong-obovate, rarely ovate or (the upper) lanceolate, acute, rarely obtuse, with cuneate base, the margin sinuate-dentate; veins thick, very prominent, almost flabellately divergent, furcately branching, much thickened distally, terminating in teeth and produced into spiny points; largest leaves 7–13 mm long, 3.5–10 mm wide, below middle of stem; head at end of stem dense, 20–50-flowered, 1–1.5 cm in diameter, 1–2 very distant few-flowered verticillasters sometimes developed below; heads at ends of axillary branches usually few-flowered; floral leaves 4–5 mm long, 1–1.5 mm wide, narrowly lanceolate or linear, often with 3 teeth at apex; bracts nearly subulate, entire, $1/3$ – $2/5$ as long as calyx; calyx tubular-campanulate, 7–9 mm long, covered with short appressed simple hairs sometimes interspersed with capitate glands; teeth of upper lip triangular, 2.5–3 mm long, half as long as tube, the 2 lower teeth lanceolate-linear, longer, 3–4 mm long; corolla bluish, 11–13 mm long, with long slender tube gradually widening into neck 1–1.5 mm long and 2.5–3 mm wide; upper lip 3–4 mm long, cut to $1/3$ into 2 lobes, rostriformly recurved above; lower lip tapering toward base, concave, deeply 3-partite, the lateral lobes oblong-ovate, acute or apiculate, spreading, the middle lobe ca. 3 mm long, 5 mm wide, entire at truncate apex, with large crenae at sides; upper stamens as long as upper lip, lower stamens included in throat or slightly exserted; nutlets obovoid, 1.7–2 mm long, 0.7–0.8 mm wide, greenish or dark brown, with small yellowish scales (remnants of coat). Fl. first half of June to July; fr. from first half of July.

Stony and gravelly sliding taluses, mainly in high-mountain steppe and desert belts. — Centr. Asia: Pam.-Al. (W. Pamir: Shugnan and Vakhan). Gen. distr.: probably in adjacent parts of Tibet (Kashmir). Described from Shugnan, Pyandzh River, between Anderob village and Khorog Mountain. Type in Leningrad.

479 2. *K. korshinskyi* (Lipsky) Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 276. — *Nepeta korshinskyi* Lipsky in Tr. Bot. sada, XXIII (1904) 222, p. p. quoad typum; O. and B. Fedch. Perech. rast. Turk. V, 141, p. p.

Perennial; root woody, more or less twisted, passing at the top into a short unbranched or short-branching rhizome; stems many, tufted, reclinate, then ascending, more or less arched, densely beset with very small sessile capitate glands forming a powdery bloom, 1–1.75 mm in diameter in lower part, with internodes 2–4.5 cm long, branching; axillary branches much shorter than main stem, 3.5–10 (12) cm long, usually (except the lower) bearing inflorescences; leaves of fine consistency, pale green, covered on both sides with thin, sessile, capitate glands, orbicular-ovate to subreniform, with truncate or notched base, rounded or obtuse at apex, veins flabellately divergent and prominent; largest leaves at middle of stem, 12–20 mm long, 10–23 mm wide, the sinuate-dentate margins with acute



PLATE XXVIII. 1 – *Kudrjaschevia korshinskyi* (Lipsky) Pojark., general aspect, flower, corolla spread out; disk after shedding of nutlets, nutlet; 2 – *K. jacubi* (Lipsky) Pojark., general aspect, flower, corolla spread out, nutlet.

non-spinescent teeth; semiverticels sessile, the upper forming a hemispherical 10-15-flowered head 12-17 mm in diameter; 1-2 lower (2) 6-8-flowered verticillasters sometimes remote on the stem; floral leaves of lower semiverticels 2.5-8 mm long, ovate or obovate, sinuate-dentate, those of upper semiverticels narrowly lanceolate, resembling bracts but with 2-5 small teeth near apex; bracts 2.5-5 mm long, narrower, to nearly subulate; pedicels 0.75-1.5 mm long; calyx 6-7 mm long, obconical, densely covered (like bracts) with small sessile glands, these intermixed along nerves and margin with short-stipitate glands; teeth of upper lip triangular, acute or acuminate, 2/3 as long as tube, the 2 teeth of lower lip longer and narrower, lanceolate, long-acuminate; corolla blue, 11-15 mm long, with slender tube 1-1.5 mm longer than calyx, gradually widening above into neck 1.5-2 mm long and 2.5-3 mm wide; upper lip cut to about the middle into broad obtuse lobes; lower lip tapering to claw, the lateral lobes oblong-ovate, obtuse, the middle lobe 1.8-3 mm long, 4-5 mm wide, coarsely crenate at sides, sometimes broadly notched; upper stamens slightly shorter than upper lip; lower stamens with slender filaments half as long, the fertile anthers half as large, reaching only the base of upper lip or slightly longer; nutlets pale, grayish-brown, oblong-ovoid-ellipsoid, 1.8-2 mm long, 0.7-1 mm wide, not scaly. Fl. June-July; fr. from end of June. (Plate XXVIII, Figure 1.)

Rock crevices and stones in upper part of the wood and scrub belt. — Centr. Asia: Pam.-Al. (Darvaz). Endemic. Described from Darvaz, Pyandzh River between Kergovat and Dashtak. Type (lectotype) in Leningrad.

- 480 Series 2. *Nadinaeanae* Pojark. — *Nepeta* § *Glechomella* Lipsky in Tr. Bot. sada, XXIII (1904) 239. — Flowers in 3 (1-2)-flowered cymes in axils of loosely approximate upper pairs of leaves, the lower of these resembling cauline leaves in shape and size; lower stamens exerted from throat, their perfect anthers 2/3 as large as those of upper stamens. Monotypic series.

3. *K. nadinae* (Lipsky) Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 281. — *Nepeta nadinae* Lipsky in Tr. Bot. sada, XXIII (1904) 239; O. and B. Fedch. Perech. rast. Turk. V, 148.

A low perennial; root vertical, woody but apparently soft, twisted, splitting longitudinally, passing above into a short multicapital rhizome covered with dark brown scales (same color as rhizome and root); stems many, very slender, 0.4-0.7 mm thick, brittle, 5-12 cm long, simple, covered with fine spreading glandular hairs; leaves concolor, pale green, thin, with simple and glandular (thin and long) hairs on both sides, the margin glandular-ciliate; cauline leaves 6-20 mm long, 4.5-16 mm wide, largest at summit, progressively smaller toward base of stem (the lowermost squamiform), broadly ovate, rounded at base, obtuse at apex, or else rhombic-ovate or obovate, with cuneate base and acute apex, sinuate-dentate with mucronate teeth, the mucro formed by the thickened end of a lateral vein or its ramification, otherwise veins very thin, inconspicuous, flabellately disposed; petioles 1/3-1/2 as long as blade, densely glandular-hairy; cymes 3-flowered, sometimes reduced to 1-2 flowers, upper pairs on peduncles 1.5-2.5 mm long, usually approximate, one pair often very distant with peduncles to 5 mm long; lower pair of floral leaves completely resembling the cauline, sometimes even larger, others smaller and

narrow, all acutely toothed, attenuate to long petiole, the margin sparsely long-ciliate; pedicels slender, 1.7–2.2 mm long, the subtending bract subulate or subfiliform, up to 9–10 mm long; calyx narrowly campanulate, 8–11 mm long, more or less suffused with violet, 13-nerved, sparsely covered outside with long fine spreading glandular hairs, 2-lipped; upper lip cut to 1/3 into oblong-triangular or lanceolate acuminate teeth; lower lip cut to the middle or beyond into much narrower lanceolate-subulate long-aristate teeth; corolla
481 blue, 14–18 mm long, sparingly pubescent outside; tube long, slender, curved, markedly exerted from calyx, gradually narrowing into neck 2–2.5 mm long, 3–3.5 mm wide; upper lip 4–5.5 mm long, cut to 1/3–1/2 into obtuse lobes, with recurved lobule on outer margin starting nearly at apex; lower lip obliquely ascending, divergent from upper lip at an acute angle, the lateral lobes large, 3–3.8 mm long, 1.5–6.8 mm wide, oblong-ovate, oblique, directed forward and upward, the middle lobe broader than long, cordate at base, entire, with swelling at base and below it with a pocket-shaped depression; upper stamens somewhat shorter than upper lip of corolla; lower stamens shorter, the anthers 2/3 as large as in the upper stamens; nutlets oblong, 2.5 mm long, 0.7 mm wide, obtuse at both sides, pale brown, faintly trigonous. Fr. and fl. second half of August.

Alpine belt, cliffs, in shade. — Centr. Asia: Pam.-Al. (Darvaz). Described from vicinity of Motraun village at northern slope of Yazgulemskii Range. Type in Leningrad.

Series 3. *Jacubianae* Pojark. — Flowers in few-flowered cymes, these developing in the axils of nearly all leaves, mostly loosely dichotomously branching; lower stamens transformed into staminodes concealed in the dilated part of corolla-tube. Annuals.

The series consists of one species.

4. *K. jacubi* (Lipsky) Pojark. in Bot. mat. gerb. Bot. inst. AN SSSR, XV (1953) 281. — *Nepeta jacubi* Lipsky in Tr. Bot. sada, XXIII (1904) 237; O. and B. Fedch. Perech. rast. Turk. V, 147.

Annual, 9–30 cm high, all parts densely covered with fine whitish capitate glandular hairs; stems simple or in lower part with 2–3 (rarely 4–5) pairs of axillary fertile branches, more or less densely covered (in addition to glandular hairs) with basally thickened simple hairs; leaves thin (chartaceous when dry), pale green, glaucescent beneath, glandular-hairy, the margin and veins beneath with short curved basally thickened simple white hairs; lower leaves 0.4–4 cm long, 0.4–2 cm wide, ovate or elliptic, rounded or cuneate at base, obtuse at apex, the margin with remote acute or obtuse teeth, the slender petiole as long as blade; middle leaves narrower, oblong-elliptic, short-petioled; upper leaves narrowly lanceolate, gradually tapering to cuneate base, acute, terminating in a rigid point, with 1–2 (4) teeth in middle part or entire, sessile; cymes in remote pairs, (2) 3–5-flowered, lax, mostly loosely dichotomously branching, with developed axes 5–13 mm long; pedun-
482 cles slender, the upper 5–10 mm long, half as long as floral leaves, others 12–20 mm long, shorter than to exceeding floral leaves; sheathing leaves of cymes to 1 cm long, narrowly lanceolate; pedicels 1.5–2.5 mm, the central 5–15 mm long; bracts 2.5–5 mm long, narrowly lanceolate, terminating in a rigid point; calyx 4–5 mm long, 15-nerved, straight, in flower nearly obconical, in fruit broader, campanulate, diffusely glandular-hairy, the nerves with sparse short 2-jointed basally thickened simple white hairs; teeth erect, the

upper oblong-ovate to lanceolate, half as long as tube, the lower to half as long again as tube, narrowly lanceolate, all with parallel margins, abruptly attenuate to a point, this longer in lower teeth; corolla 5–6.25 mm long (lilac-blue when dry), subglabrous outside, the tube and lower part of neck included in calyx; tube curved, 3–4 mm long, widening into frontally somewhat inflated neck 1.5–1.7 mm long and 1.4–1.6 mm wide; upper lip cut into 2 erect lobes 1–1.3 mm long and 1.4–1.6 mm wide, with short retroflexed lobules; lower lip obliquely ascending, at an acute angle to upper lip, the middle lobe 1.2–1.5 mm long, 2–2.2 mm wide, truncate at apex with a small notch at the middle, tapering toward base into a short claw, flat, entire, the lateral lobes ovate, directed forward, ca. 1 mm long, 0.6 mm wide; upper stamens slightly shorter than upper lip; staminodes with anthers reduced to a small swelling and short slender filaments; style shorter than upper stamens; nutlets 1.4–1.5 mm long, 0.8–0.9 mm wide, ellipsoid, pale brown, smooth, shining, with an obtuse indistinct edge on the convex ventral side. Fl. May–June; fr. second half of June to July. (Plate XXVIII, Figure 2.)

Upper part of juniper forest belt and subalpine belt, at altitudes of 2500–3200 m, stony slopes, limestone outcrops. — Centr. Asia: Pam.-Al., western part (Kugitang, Vakhsh, Zerafshan ranges). **Gen. distr.:** Iran. (N. Afghanistan, southern slope of Badkhyz). Described from Chai-Dara River on Zerafshan Range. Type (lectotype) in Leningrad.

Genus 1258.* **Lallemantia**** Fisch. et Mey.

Fisch. et Mey. Ind. sem. hort. Petrop. VI (1839) 52.

483 Flowers 4–6 in remote whorls in axils of leaves forming a long spikelike inflorescence; pedicels short, erect, flattened; bracts cuneate, flabelliform or obovate, with long-awned teeth; calyx tubular, 5–10-nerved, almost straight, with 5 more or less equal mucronate erect or curved teeth, the upper wider, the lower narrower; teeth convergent in fruit; corolla azure, azure-violet or blue, rarely yellowish-white; tube narrow, widening toward throat, included in calyx; upper lip more or less concave, cut into 2 small lobes, with 2 longitudinal folds within; lower lip 3-lobed, declined, with broad reniform depressed middle lobe; stamens 4, the upper longer than the lower; filaments free, bearded at base; anthers 2-celled, with divergent cells; style bifid above; nutlets smooth or finely punctate, oblong, 3-angled, dark brown, dark cinnamon-brown or black. Herbaceous, annual or biennial plants, glabrous or pubescent with simple or branching stems; lower leaves ovate, long-petioled, crenate-dentate at margin; upper leaves and floral leaves lanceolate, petioled, nearly entire.

Five species occurring in the USSR and Asia Minor, Iran, Afghanistan and Baluchistan.

1. Bracts ovate or orbicular, 4–9 mm wide; calyx with large teeth, the uppermost ovate, 4.5 mm long, 3 mm wide, 2–3 times as wide as the others; corolla slightly longer than calyx 1. **L. peltata** (L.) Fisch. et Mey.

* Treatment by S.G. Gorshkova.

** In memory of the botanist E. Kh. Ave-Lalleman, junior assistant to the director of the Petersburg Botanical Garden in 1838–1855.

- + Bracts cuneate, cuneate-flabellate or elliptic, (1) 2-4 (4.5) mm wide; uppermost tooth of calyx ovate-oblong, 1.7-3.5 mm long, 2 mm wide, slightly wider than the others or sometimes equal; corolla 1½-2 times as long as calyx, rarely longer . . . 2.
- 2. Corolla twice as long as calyx, 4-5 times as long as bracts and nearly equaling floral leaves. Plant puberulent, canescent 2. **L. canescens** (L.) Fisch. et Mey.
- + Corolla slightly exceeding or half as long again as calyx, 1½-2 times as long as or shorter than bracts, 1/2-2/3 as long as floral leaves 3.
- 3. Plants glabrous; corolla half as long again or sometimes as long as calyx, 1½-2 times as long as bracts and 1/2-2/3 as long as floral leaves 3. **L. iberica** (Stev.) Fisch. et Mey.
- + Plants pubescent; corolla slightly exceeding calyx, twice as long or about as long or 2/3 as long as bracts 4.
- 4. Corolla 6.5-8.5 mm long, azure, the tube included in calyx, the limb 2 mm long; bracts cuneate-flabellate, half as long again or as long as corolla 4. **L. royleana** Benth.
- 484 + Corolla 9-10 mm long, blue, the tube exerted from calyx and abruptly widening into throat, limb 4-4.5 mm long; bracts elliptic, nearly half as long as corolla 5. **L. baldshuanica** Gontsch.

1. **L. peltata** (L.) Fisch. et Mey. Ind. sem. hort. Petrop. VI (1839) 53; Ldb. Fl. Ross. III, 1, 390; Boiss. Fl. or. IV, 674; Grossg. Fl. Kavk. III, 298. — *L. peltata* var. *albiflora* Sosn. Fl. Gruzii IV (1952) 312. — *Dracocephalum peltatum* L. Sp. pl. (1753) 596. — *D. ocimifolium* Mill. Gard. Dict. ed. VIII (1708) No. 4. — **Ac.**: Pflanzenfam. IV, 3a, 239; Sorn. rast. SSSR, IV, Fig. 387, 4.

Annual, glabrous or puberulent, 15-50 cm high; stems erect, simple or branching; lower leaves ovate or oblong, 4-4.5 cm long, 1.5-2 cm wide, nearly twice as long as petiole, finely serrate; floral leaves lanceolate or linear, 1.5-4 cm long, 0.3-1.2 cm wide, sessile, entire, much longer than flowers, whorls 6-10-flowered, more or less remote, forming a lax inflorescence 3-16 (22) cm long and 1.5-2 cm wide; bracts 0.7-1 cm long, 0.4-0.9 cm wide, reticulate-nerved, ovate or orbicular, densely and shortly awned-toothed, ciliate (1.5-2 mm long), pale green, with flat petiole 1 mm long; calyx 1.2-1.3 cm long, 2-2.5 mm wide, slightly shorter than corolla, covered outside on nerves and within with short hairs; teeth large, spiny-tipped, green or sometimes violet at margin, the uppermost tooth ovate, 4.5-5 mm long, 3 mm wide, 2-3 times as broad as lateral teeth, these oblong, 3.5 mm long, 1.3 mm wide, lower teeth lanceolate, 3.5 mm long, 0.7 mm wide; corolla violet-blue, 1.4-1.8 cm long, or white (f. *albiflora* Grossh.), pubescent outside, the tube 8.5 mm long, 0.7-1 mm wide; upper lip 2.5-3 mm wide, with a small notch; lower lip 3 mm long, the middle lobe 1.5-2 mm long, 3.5-4 mm wide, obtusely incised, serrulate at apex and along margin, 3-4 times as broad as the rounded-oblong lateral lobes; style 12 mm long; nutlets oblong-ovoid, 3-3.5 mm long, 1.5 mm wide, 3-angled, dark brown or black, punctulate. May-July.

Dry stony mountain slopes to altitude of 1850 m. — Caucasus: Cisc., W., E. and S. Transc., Dag., Tal.; Centr. Asia: Mtn. Turkm. **Gen. distr.**: Bal.-As. Min., Arm.-Kurd., Iran. Described from the "East." Type in London.

Note. A weed of cultivated and fallow fields, mainly infesting crops. A good honey-bearing plant. Comparable to *L. iberica* (Stev.) Fisch. et Mey. (Grossg. Rast. res. 86, 295).

485 2. *L. canescens* (L.) Fisch. et Mey. Ind. sem. hort. Petrop. VI (1839) 53; Boiss. Fl. or. IV, 675; Grossg. Fl. Kavk. III, 298. — *Dracocephalum canescens* L. Sp. pl. (1753) 595. — *L. azurea* Boiss. et Huet. ex Boiss. l. c. 675. — Ic.: Pflanzenfam. IV, 3a, 239.

Biennial; stems many, 10–30 (40) cm long, branching; stems and leaves canescent with short gray pubescence; lower leaves oblong-ovate, slightly longer than petiole, 2 cm long, 1–1.5 cm wide, crenate-dentate at margin, petioles 1.5 cm long; other leaves oblong-lanceolate, 4.5–6 cm long, 0.5 cm wide, subsessile, crenate-dentate; whorls 4–5-flowered, forming a lax spikelike inflorescence 12–15 cm long, 4 cm wide; floral leaves linear, 2–3 cm long, 0.2–0.4 cm wide, sessile, nearly as long as corolla; bracts cuneate-flabellate, 8 (9) mm long, 2.5 mm wide, with 5–7 acuminate teeth 1–2 mm long; calyx pubescent, 1.6–2 cm long, 3.5 mm wide, the uppermost tooth broadly ovate-oblong, 3.5 mm long, 2 mm wide, the lateral teeth lanceolate, 3.5 mm long, 1.5 mm wide, the lower teeth narrowly lanceolate, slightly longer and narrower than others, 4 mm long, 1 mm wide, all teeth mucronate; corolla azure-violet or azure, (2) 3–4 cm long, twice the length of calyx, puberulent outside; upper lip 6–9 mm long, cut into semiorbicular lobes 1.5 mm long; lower lip 1/3 longer than the upper, with broader middle lobe, 0.3–0.4 cm long, 0.9–1.2 cm wide, obtusely emarginate, obscurely serrate, 3–4 times as broad as the rounded-ovate lateral lobes; style 2.5–2.7 mm long; nutlets oblong, 3-angled, 3.5–4 mm long, 1.5–1.8 mm wide, dark brown or black, punctulate. June–August.

Dry slopes, a weed or introduced. — European part: M. Dnp. (Kursk region, Shchigrov, growing wild in gardens); Caucasus: E. and S. Transc. Gen. distr.: Bal.-As. Min., Arm.-Kurd., Iran. Described from the East. Type in London.

3. *L. iberica* (Stev.) Fisch. et Mey. Ind. sem. hort. Petrop. VI (1839) 53; Ldb. Fl. Ross. III, 1, 391; Boiss. Fl. or. IV, 674; Grossg. Fl. Kavk. III, 298. — *Dracocephalum ibericum* Stev. in M. B. Fl. taur.-cauc. II (1808) 64; Shmal'g. Fl. II, 325. — *D. aristatum* Bertol. in Nov. Comm. Ac. Sc. Inst. Bonon. VI (1844) 225, No. 59. — *L. sulphurea* C. Koch in Linnaea, XXI (1848) 679. — Ic.: Sorn. rast. SSSR, IV, 33, Fig. 387; Post, Fl. Syriae, Palaest. a. Sin. 639.

486 Annual; a subglabrous plant; stems simple, erect or [?] branching below, 10–15 (50) cm long; lower leaves on petioles 0.5–1 cm long, oblong, 4.5 (6) cm long, 1.1–1.8 cm wide, acute, obscurely dentate with rounded teeth; upper leaves oblong-linear, 4–4.5 cm long, 1.1 cm wide, tapering at base; flowers many, in loose remote whorls, forming a lax spike-like inflorescence 4–17 cm long, 1.5–2.5 cm wide; floral leaves sessile, linear-lanceolate, 1.4–2 (4.5) cm long, 0.3–0.6 (1) cm wide, obtuse, nearly twice as long as flower; bracts with small petiole or subsessile, ovate, flabellate or cuneate, 0.6–1 cm long, 0.2–0.4 cm wide, with 5–7 awned teeth 0.7–0.8 cm long, slightly shorter than bracts; calyx short-hairy scabrous along nerves, 0.8–1 (1.5) cm long, 1.5–3 mm wide, with mucronate teeth, the upper tooth ovate, 3.5 mm long, 2 mm wide, lower teeth lanceolate, 3 mm long, 1–1.3 mm wide; corolla blue, violet-azure or whitish-yellow (f. *sulphurea* Grossh.), 1.1–1.5 (1.8) cm long, nearly half as long again or sometimes as long as calyx, more or less puberulent outside, with small limb; upper lip 4 mm long, 2–3 mm wide; lower lip 2.5–3 mm long, the middle lobe 2.5 mm long, 2 mm wide, at least twice as broad as the ovate lateral lobes; style 1.2–1.4 mm long; nutlets 3–5 mm long, 0.8–1.8 mm wide, trigonous, acuminate at base, dark brown or black. April–June.

Dry gravelly slopes, gravelly terraces with tragacanth and juniper, stony taluses; ascending in mountains up to 1700 m; sometimes a weed among crops. — European part: Bl. (Novomoskovsk, introduced); Caucasus: Cisc. (Nevinnomysskaya, Stavropol'), E. and S. Transc., Tal.; Centr. Asia: Mtn. Turkm. (Kopet Dagh). **Gen. distr.:** Med. (E.), Bal.-As. Min., Iran. Described from Georgia. Type in Helsinki.

Economic importance. The seeds contain 24–38% oil with iodine number 162–167, according to other data 192.4–196.8. The oil has excellent industrial properties and is used in preparation of high quality drying oil, varnishes, oil paints, lubricating and lighting oil, etc. A nectariferous plant. It has recently been introduced into cultivation in Transcaucasia (Grossg. Rast. res. 86, 295). It occurs as a weed of summer crops; often rather noxious.

4. *L. royleana* Benth. in DC. Prodr. XII (1849) 404; Ldb. Fl. Ross. III, 391; Boiss. Fl. or. IV, 674; O. and B. Fedch. Perech. rast. Turk. V, 154; Fedch. Rast. Turk. 675; Grossg. Fl. Kavk. III, 298. — *Dracocephalum royleanum* Benth. in Wall. Pl. As. Rar. I (1830–1832) 65; Shmal'g. Fl. II, 326. — *D. inderiense* Less. ex Kar. et Kir. in Bull. Soc. Nat. Mosc. XV (1842) 423. — *Nepeta cordiifolia* Boiss. Diagn. Ser. 1, 5 (1844) 24. — **lc.:** Fedch. and Fl. Fl. Evrop. Ross. 810. — Exs.: GRF, 1428; HFAM, No. 210.

Annual; plant 5–20 (30) cm high, hoary with dense short pubescence; stems simple or branching; lower leaves with petioles 1.8–2 cm long, ovate, (1.5) 2–3.5 (4) cm long, 0.8–2 (2.5) cm wide, crenate, at base truncate or short-cuneate; terminal leaves ovate-cuneate, 487 subsessile, 1–1.5 (2.5) cm long, 0.8–1.5 cm wide; whorls 4–6-flowered, in elongate, upright interrupted spicate inflorescence 6–14 (20) cm long, 0.8–1.2 cm wide; floral leaves obovate or oblong-cuneate, 0.9–1.4 (2) cm long, subsessile, sparsely toothed at margin, exceeding flowers; bracts cuneate-flabellate, 0.7–1.4 cm long, 2.5–4.5 mm wide, with petioles 1–1.5 mm long, sometimes exceeding calyx, awned-dentate with 2–3 (4) aristate teeth 2.5–4 (8) mm long, more than half the length of bract; calyx tubular, 5–6.5 (7) mm long, 1–1.3 mm wide, patent-hairy, prominently nerved; teeth short, obtuse, at length involute, the uppermost tooth ovate, 1.7 mm long, the lower teeth oblong, 1 mm long, narrower; corolla azure, 6.5–8.5 (9) mm long, slightly exceeding calyx, pubescent and glandular outside, 2-lipped; upper lip 1.5–2 mm long, 1.5 mm wide; lower lip 3-lobed, the middle lobe 2 mm long, 4 mm wide, the lateral lobes 1 mm long, oblong; stamens 4; ovary oblong, 2 mm long, 0.7 mm wide; style 4 mm long; nutlets oblong, 2–3 mm long, 1 mm wide, trigonous, dull, blackish-brown or black. April–June.

Desert and semidesert zone and foothill belt. — European part: L. V. (near Inder Lake); Caucasus: E. and S. Transc.; West Siberia: U.-Tob. (Atbasar area); Centr. Asia: Ar.-Casp., Balkh., Kyz. K., Kara K., Mtn. Turkm., Amu-D., Syr. D., Pam.-Al., T. Sh. **Gen. distr.:** Iran., Ind.-Him., W. Ch. Described from India. Type in London.

Note. A weed in open spaces and streets, wastelands, abandoned and cultivated fields.

5. *L. baldshuanica* Gontsch. in Tr. Tadzh. bazy AN SSSR, II (1936) 184. — *L. canescens* auct.: O. and B. Fedch. Perech. rast. Turk. V, 154, non Fisch. et Mey.; Fedch. Rast. Turk. 675.

Annual; stem 15–40 cm long, simple or branching, sparingly pubescent; leaves with puberulent petiole 7–11 mm long, oval, more or less rounded at base and at apex, 1.5–3 cm long, 0.9–1.5 cm wide, crenate, bright green subglabrous above, grayish-puberulent beneath; floral leaves lanceolate, 1–2 cm long, 0.2–0.5 cm wide, decreasing in size toward summit of

inflorescence, gradually tapering to petiole 2–3 mm long, subacute, with few long-aristate teeth in lower part; bracts elliptic, 5 mm long, 1 mm wide, short-petioled, with aristate teeth, the awns 3.5–5 mm long; semiverticels 4–6-flowered, remote, in inflorescences 10–15 (23) cm long; pedicels 1–2 mm long; calyx pubescent, 6–7.5 mm long; teeth acute, unequal, 1–1.5 mm long, 0.6–1 mm wide, the uppermost tooth larger, oblong, long-awned; 488 corolla blue, 0.9–1.1 cm long, 1 mm wide, pubescent outside (except the middle lobe of lower lip) glabrous within; corolla-tube exserted, abruptly widening into throat, the dilated part 7–9 mm long; upper lip erect, 2–2.5 mm long, 1.8–2 mm wide, cut into two rounded-oval lobes; lower lip nodding, 4–5 mm long, the lateral lobes suborbicular, 0.6–1 mm long, 0.7 mm wide, the middle lobe reniform, slightly emarginate, 2–2.5 mm long, 4–5 mm wide; nutlets linear-oblong, smooth, 3 mm long, 1 mm wide, subtrigynous.

Loess foothills, zone of ephemeral vegetation. — Centr. Asia: Pam.-Al. Described from Tut-Kaul, Vakhsh River. Type in Leningrad.

Genus 1259.* **Hymenocrater**** Fisch. et Mey.

Fisch. et Mey. Ind. sem. hort. Petrop. II (1835) 39. — Sestinia Boiss. Diagn. Ser. 1, 5 (1844) 40.

Flower usually numerous, sessile or short-pedicelled, in 2–7-flowered cymes or semiverticels, these approximate above, distant below, forming a pyramidal or subspicate inflorescence; calyx-tube short, cylindrical or infundibular, profusely sulcate, with hairy ring in throat; limb large, scarious, dilated, 5-fid, declined, with ovate or elliptic segments, these strongly enlarging in fruit; corolla long, the tube elongate, curved, exserted, expanding at throat, often nearly inflated, glabrous within, the limb short, indistinctly 2-lipped; upper lip 2-partite, erect; lower lip 3-partite, declined, the middle segment mostly larger, broader, concave, more or less notched; stamens 4, included, sometimes nearly exceeding the upper lip; anthers divergent; style with bifid stigma; nutlets ovoid, smooth or finely tuberculate. Subshrubs, glabrous or pubescent, with gray or yellowish-gray bark, numerous erect branches and ovate or broad-ovate, dentate, acute leaves.

The genus contains 9 species distributed in the southern part of Central Asia, Caucasus, Asia Minor, Iran.

1. Plant pubescent; flowers few, paired in pedunculate cymes; bracts linear-oblong, slightly shorter than calyx-tube; calyx densely hairy along nerves, with pink-violet limb; corolla reddish; nutlets ovaloid, smooth with nerves on the back, almost 489 ribbed 1. **H. elegans** Bge.
- + Plant subglabrous; flowers many, in subsessile 5–7-flowered cymes, forming a dense oblong spicate inflorescence; bracts oblong-lanceolate or lanceolate, as long as calyx-tube; calyx glabrous, with pale yellow or rufous limb; corolla violet, white-lineate; nutlets ovoid, finely verrucose 2. **H. bituminosus** Fisch. et Mey.

* Treatment by S.G. Gorshkova.

** From the Greek hymen, skin, and krater, vessel, referring to the calyx with its large, coriaceous limb.

1. *H. elegans* Bge. in Mém. Acad. Sc. Pétersb. VII sér. XXI (1873) 63; Boiss. Fl. or. IV, 678. — *H. bituminosus* var. *elegans* O. Ktze in Tr. bot. sada, 1 (1887) 228.

Perennial; stem 35–150 cm long, sparingly pubescent, with numerous resinous glands, with gray bark and many elongate erect branches; leaves ovate, 1.3–2 cm long, 1–2 cm wide, glandular-punctate, acute, incised-dentate, covered with short white hairs, truncate or subcordate at base, petioles 0.5–1.2 cm long; upper leaves 1 cm long, 0.5–1 cm wide, sessile, remote; bracts 3.5–4 mm long, 1 mm wide, slightly shorter than calyx-tube, linear-oblong, acute, almost scarious, hairy, ciliate, nearly amplexicaul; calyx 1.2 (2) cm long, accrescent in fruit; tube cylindrical, 5 mm long, 2.5 mm wide, with hairy ring in throat, with numerous nerves densely covered with white hairs; limb rotate, 2–2.2 (2.6) cm in diameter, pink-violet, twice as long as tube, 5-partite and netted, the lobes ovate-orbicular, 0.6–1.2 cm long, 0.8–1 cm wide, obtuse, 3-nerved; corolla 1.6–2 cm long, curved, nearly 1/3 longer than calyx, reddish, finely glandular-hairy outside, the tube 1.3–1.6 cm long, 1–2 cm wide, widening at throat, glabrous inside, 3 times as long as calyx-tube, the short limb obscurely 2-lipped; upper lip 2-partite, 1.5 mm long, the lobes obovate, 1 mm long, 1.8–2 mm wide, entire, imbricate; lower lip 3-partite nearly to base, 3.5 mm long, the lateral lobes 1.2 mm long, 1.7 mm wide, obovate, obtuse, the middle lobe reniform, orbicular, 2–2.5 mm long, 3.5–3.8 mm wide, entire; stamens 4, scarcely exerted; style 1.7 mm long, with bifid stigma; nutlets ovaloid, brown, 3–3.5 mm long, 1.5 mm wide, smooth, trigonous, sharp-beaked at apex, with nerves on the back, almost ribbed. April–May.

Steppe belt of mountains. — Centr. Asia: Mtn. Turkm. (Kopet Dagh near Kheirobad).

Gen. distr.: Iran. Described from N. Iran. Type in Paris.

490 2. *H. bituminosus* Fisch. et Mey. Ind. sem. hort. Petrop. II (1835) 39; Fedch. Rast. Turk. 675. — Boiss. Fl. or. IV, 676; Grossg. Fl. Kavk. III, 299. — *H. secundiflorus* Jaub. et Spach, Ill. Pl. or. V (1853–1857) 63. — *H. aucheri* Jaub. et Spach, l. c. 61. — **lc.:** Jaub. et Spach, l. c. tab. 457; Mey. in Sert. Petrop. II, tab. 4. — **Exs.:** Herb. Fl. Cauc. No. 184.

Perennial; stem 30–100 cm long, subglabrous, with gray or yellowish-gray bark; branches simple, erect; leaves subcoriaceous, cordate-ovate, 1.5–2.5 (3) cm long, 1.2–2 cm wide, 3–5-veined, obtuse, with rounded obtuse teeth, resinous-punctate, with petiole 3 mm long; upper leaves 1–2 cm long, 0.6–1.2 cm wide, reniform or cordate, round-toothed, acute; flowers short-pedicelled, almost nodding; cymes 5–7-flowered, sessile, approximate, interrupted below, forming a dense pyramidal or oblong spicate inflorescence; bracts opposite, oblong-lanceolate or lanceolate, (2.5) 5 mm long, 1 mm wide, nearly as long as calyx-tube, scarious, finely ciliolate, mucronate; calyx nearly infundibular, glabrous, 1.4–1.6 cm long; tube profusely striate, 4–4.5 mm long, 2 mm wide, with hairy ring in throat; limb 2–2.4 cm in diameter, 5-partite, reticulate, rotate; lobes pale, yellowish or rufescent, scarious, broadly ovate to suborbicular, 1–1.2 cm long, 0.6–1 cm wide, subequal, mucronulate or obtuse; corolla violet, white-striped, 1.5–1.7 (2) cm long, finely glandular-hairy outside; tube 1.3–1.5 cm long, 1–1.5 mm wide, 3 times as long as calyx-tube, gradually widening above, obscurely 2-lipped, with declined limb; upper lip 2 mm long, 2-partite, the lobes obovate to suborbicular, 1.5 mm long and as wide, entire, imbricate; lower lip 3-partite nearly to base, 4 mm long, the lateral lobes resembling the lobes of upper lip, 1.8 mm long, the middle lobe subcuneate-orbicular, 2 mm long, 2.6 mm wide, slightly longer and broader than lateral lobes, all lobes entire; stamens 4, short; style

1.6 mm long; nutlets ovoid, 3–3.5 mm long, 1.8–2 mm wide, brown, finely verrucose. April–May.

Gravelly, clayey mountain slopes in lower mountain zone, at altitudes of 600–2000 m. — Caucasus: S. Transc.; Centr. Asia: Mtn. Turkm. **Gen. distr.:** Iran. Described from N. Iran. Type in Leningrad.

Note. *H. calycinus* (Boiss.) Benth., reported for Mtn. Turkm., does not apparently differ from *H. bituminosus* and for this reason we are not including it in “Flora of the USSR.”

Economic importance. The plant yields oil with a pleasant lemonlike odor (Grossg. Rast. res. Kavkaza, 313).

491 Genus 1260.* **Hypogomphia**** Bge.

Bge. in Bull. Ac. Sc. Pétersb. VII sér., XVIII (1873) 30.

Flowers in whorls in the leaf axils; calyx campanulate, obscurely 10-nerved, with 5 broad triangular subequal teeth; corolla finely glandular-hairy outside, 2-lipped; tube curved, with a hairy ring inside; upper lip narrow, oblong-spatulate, emarginate, more or less arched; lower lip 3-lobed, the middle (uppermost) lobe rounded, emarginate, the lateral lobes triangular; lower stamens with very short slender twisted distally thickened filaments and imperfect anthers; filaments of upper stamens long, dilated toward base, arched in upper part and declined at nearly a right angle to upper lip, with perfect anthers; style slender, filiform, 2-partite at apex, with flat (linear) stigma lobes; nutlets oblong, slightly convex on outer side, obtusely dihedral on inner (ventral) side, grayish-brown, finely granular, obtuse at the areola; areola round. Annual herbs, covered with short glandular and longer spreading fine eglandular jointed (multicellular) hairs. According to Bunge (l. c.), this genus differs markedly from other Labiatae in the structure of the stamens (abortive lower stamens). It may be mentioned that in species of *Hypogomphia* the cotyledons are oval and are retained on the plant until flowering.

1. Corolla (5) 8–10 mm long 1. **H. turkestanica** Bge.
+ Corolla (12) 15–20 mm long. 2. **H. elatior** (Rgl.) Vass.

1. **H. turkestanica** Bge. l. c.; Regel' in Tr. Bot. sada, IX, 2 (1886) 610 (sub *H. turkestanica* Bge. nom. err. α . typica Rgl.); O. and B. Fedch. Perech. rast. Turk. V, 155; B. Fedch. Rast. Turk. 675; Ik.-Gal. in Sorn. rast. SSSR, IV, 341. — Ic.: Regel', op. cit. Plate X, Fig. 22. — Exs.: Herb. Fl. As. Med. No. 211.

Annual; stem 5–20 cm long, usually branching from base, rarely simple, relatively slender, covered with copious short glandular and longer spreading eglandular hairs; radical 492 (and lower cauline) leaves oblong-obovate, with remote obtuse teeth, sometimes nearly

* Treatment by I. T. Vasil'chenko.

** From the Greek *hypo*, under, and *gomphos*, claw, referring to the twisted filaments of the lower stamens positioned in the lower part of the corolla, near the claws of the connate petals.

entire, with broad (winged) petioles; cauline leaves oblong-ovate, remotely dentate, sessile; uppermost leaves similar in shape to the cauline but smaller, sessile; all leaves with indument as on stem; flowers in 2-4-flowered axillary whorls; calyx 6-8 mm long, broadly campanulate, densely covered with short glandular and longer soft white eglandular hairs, the teeth triangular, one narrower and longer than the others; corolla white, (5) 7-10 mm long (often turning brown in drying), the tube more or less geniculate curved, 3-4 (5) mm long; upper lip nearly as long as the tube, the lower lip slightly shorter; nutlets narrowly oblong, ca. 4 mm long, 1-1.5 mm wide, shining, finely granular with small whitish tubercles, slightly convex on the back, more or less dihedral on inner side, with an obtuse edge. April-May.

Foothills and foothill plains on loess and compact clayey soils, slopes and valleys, also as a weed of wastelands, sides of ditches, sometimes among crops. — Centr. Asia: Syr D., T. Sh., Pam.-Al. Endemic. Described from vicinity of Tashkent. Type in Paris.

2. *H. elatior* (Rgl.) Vass. comb. nov. — *H. turkestanica* γ . *elatior* Rgl. in Tr. Bot. sada, IX, 2 (1886) 610.

Annual; stem (5) 15-30 (45) cm long, usually thicker than in *H. turkestanica*, branching, rarely simple, rather densely covered with soft spreading hairs and finely glandular; radical (and lower cauline) leaves oblong-ovate or oblong-obovate, with rather long and broad (winged) petioles, remotely and obtusely dentate; cauline leaves oblong or ovate-lanceolate, sessile, also remotely toothed; uppermost leaves smaller, resembling the cauline in shape; all leaves copiously covered with more or less spreading white hairs (denser on lower surface of leaf blade) and finely glandular; whorls 2-4-flowered, remote; calyx (6) 8-10 mm long, campanulate, with vestiture as on leaves, the teeth acute, triangular, shorter than tube, one tooth narrower (lanceolate) and slightly longer than the others; corolla white, (12) 15-20 mm long, with geniculate curved tube; upper lip linear-spatulate, gradually widening above, slightly emarginate; lower lip elongate-obovate, 3-lobed, the upper lobe notched (nearly 2-lobed), the lateral lobes triangular, acute; nutlets oblong, ca. 4-4.5 mm long, 1.5-1.8 mm wide, slightly larger than in the preceding species, grayish-brown, finely granular. (March) April-May.

493 Sandstone slopes, stony and gravelly slopes, pebbly valleys, soft soils (sandy or alluvial), sometimes a weed in fields and at sides of canals and ditches. — Centr. Asia: Pam.-Al. (western and southern parts). **Gen. distr.:** may possibly occur in Afghanistan. Described from Vakhsh near Kurgan-Tyube. Lectotype in Leningrad.

Note. Regel' (op. cit.) failed to sort out *Hypogomphia*. Besides having named it incorrectly ("H. turkestanica" instead of the proper name "H. turkestanica"), he erroneously reported the classical location of his "*H. turkestanica* γ . *elatior*" ("Prope Taschkent. O. Fedtschenko"). In the herbarium of the Botanical Institute of the Academy of Sciences of the USSR there is no plant with the characters described by Regel' for this variety from Tashkent. There is a plant collected by O. Fedchenko in Tashkent on 11 April 1871, but it belongs to *H. turkestanica* as indeed rightly determined by Fedchenko. This is understandable considering that *H. elatior* does not occur north of Samarkand. Of great interest is *H. turkestanica* δ . *purpurea* Rgl.; here the purple (or pink) color of the corolla persists in drying even though it becomes paler. The plant occurs on outcrops of variegated rocks (particularly red sandstone) covered only with a thin layer of soil, while the

typical *H. elatior* grows on light-textured (sandy, gravelly, etc.) soils, and *H. turkestanica* on loess and compact clayey soils. Actually, we may be dealing in this case with three well defined ecological races that might be considered as separate species. However, lacking sufficient material and observations, I have decided not to describe *H. turkestanica* δ . *purpurea* Rgl. as a species. A. I. Vvedenskii, who had more material at his disposal, adopted this approach and published the description of a new species — *H. bucharica* Vved. — in Bot. mat. gerb. AN UzSSR XIV (1954) 8, which had earlier been known as the variety indicated.

Tribe 3. STACHYDEAE Briq. in Pflanzenfam. IV, 3a (1895) 207. — Stamens 4, the upper shorter than the lower.

Subtribe 1. Brunellinae Briq. l. c. — Calyx 2-lipped of the $\frac{2}{3}$ type; lower lip of fruiting calyx incumbent upon upper lip and covering the throat; corolla with exserted tube and hooded upper lip; stamens 4, didynamous, the lower longer than the upper, ascending near together, parallel under the upper lip and not enclosed in the corolla.

494 Genus 1261.* **Prunella**** L.

L. Sp. pl. (1753) 600. — Brunella Moench, Meth. (1794) 414.

Flowers in dense ovoid or oblong, spicate inflorescences composed of crowded 6-flowered verticillasters; calyx tubular-campanulate, glabrous in throat, 10-nerved or with reticulate nervature, glabrous above, 2-lipped; upper lip flat, broad, truncate, shortly tri-dentate; lower lip bifid to the middle, with lanceolate lobes; fruiting calyx compressed and closed; corolla 2-lipped, open, with broad tube and broad limb; tube slightly exserted, with a ring of short scalelike hairs at base within, inflated under throat, slightly constricted at throat; limb 2-lipped; upper lip erect and hooded, concave, nearly keeled above, entire; lower lip 3-lobed, the lateral lobes downcurved, oblong, reclinate, the middle lobe larger, orbicular, concave, dentate; stamens exserted, close together under upper lip, parallel in pairs, free, lateral stamens longer than the middle, filaments terminating in a tooth above anthers, glabrous and without a tooth at base; anthers divergent, 2-celled; style glabrous, 2-partite at apex, the stigma lobes subulate; nutlets subglobose, ovoid, oblong or elliptic, 1.5–2.75 mm long, ca. 1 mm wide, glabrous, with 2 nerves separated by a furrow or with several nerves, cinnamon brown, with acute white areola at base, obtuse at apex. Perennials, with erect or ascending stems; leaves toothed, entire or pinnatifid, pinnatifid or pinnatipartite.

The genus contains about 15 species.

* Treatment by A. G. Borisova.

** From the Latin *pruna* (prunella), blazing coal (small piece of coal); name possibly derived from the German *braun*, brown, cinnamon brown — or *Bräune* — quinsy, angina, for which the plant used to be considered a remedy.

1. Flowers yellowish-white; bracts green; whole plant scabrous-hairy; all leaves entire or only the lower entire, upper or all leaves pinnatifid or pinnatipartite or merely dentate in lower part, with cuneate base, oblong to lanceolate (Bes., Crim., Caucasus) 3. ***P. laciniata* L.**
- + Flowers violet or dark lilac, rarely white or dingy violet; bracts mostly violet; plants mostly glabrous, rarely sparsely pubescent or stems densely patent-hairy; leaves entire and very rarely (usually the upper) pinnatifid, with broadly cuneate or cordate base, often ovate or oblong 2.
- 495 2. Corolla with straight tube 6–16 mm long, 1½–2 times as long as calyx; uppermost pair of leaves sheathing the base of inflorescence; filaments longer than stamens, with subulate tooth exceeding anthers; upper lip of calyx with 3 scarcely visible teeth; nutlets ovoid, smooth 1. ***P. vulgaris* L.**
- + Corolla with upcurved tube (16) 20–27 mm long, nearly 3 times as long as calyx; upper pair of leaves distant from inflorescence; filaments longer than stamens, with a short obtuse knob; upper lip of calyx with 3 distinct teeth; nutlets subglobose, slightly tuberculate, with distinct furrow along margin and at middle of dorsal side 2. ***P. grandiflora* (L.) Jacq.**

Series 1. *Vulgares* Boriss. — Corolla violet or dark lilac, rarely white; bracts violet.

1. ***P. vulgaris* L.** sp. pl. (1753) 600; M. B. Fl. taur-cauc. II, 66; Kryl. Fl. Zap. Sib. IX, 2333. — *P. vulgaris* var. *japonica* (Makino) Kudo in Journ. Coll. Sc. Univ. Tokyo, XLIII, 8 (1921) 23; Kom. Fl. Kamch. III, 58. — *P. parviflora* Gilib. Fl. Lithuan. II (1781) 88. — *P. officinalis* Güldenst. in Gmel. Reise, I (1774) 495. — *P. coerulea* Güldenst. l. c. 424. — *P. purpurea* Güldenst. l. c. II, 9. — *P. japonica* Makino in Tokyo Bot. Mag. XXVIII (1914) 158. — *P. asiatica* Nakai in Tokyo Bot. Magaz. XLI (1930) 19, p. p. — *Brunella vulgaris* Moench, Meth. (1794) 414; Benth. in DC. Prodr. XII, 410; Ldb. Fl. Ross. III, 392; Boiss. Fl. or. IV, 691; Shmal'g. Fl. II, 328; Grossg. Fl. Kavk. III, 300. — *B. officinalis* Crantz. Stirp. Austr. (1769) 279. — Ic.: Fedch. and Fler. Fl. Evrop. Ross. fig. 721; Taliev in Tr. Obshch. est. Khar'k. univ. XXX, Tab. 2. — Exs.: GRF, Nos. 74, 384; Pl. Finl. exs. No. 909.

Perennial; rhizome creeping, often oblique; stems erect or ascending, 8–50 cm long, subglabrous or hirsute, simple; leaves (except for uppermost pair) petiolate, ovate or oblong, obtuse, entire or the upper weakly and remotely dentate-crenate, sometimes pinnatisect (var. *pinnatifida* (Pers.) Benth.); cauline leaves distant; flowers in verticillasters crowded in capitate or spicate, ovoid or oblong, terminal inflorescences; lateral inflorescences sometimes produced, these with a pair of sessile leaves at base, rarely somewhat distant; bracts broadly ovate or suborbicular, with cordate base, the lower abruptly long-acuminate, the others with short mucro, 0.8–1.2 cm long, 1–1.5 cm wide, almost membranous-reticulate, hairy or more often subglabrous, ciliate at margin, sometimes glabrous; bracts and calyx reddish to blackish-purple; calyx sessile or short-stalked, mostly hairy at base, 2-lipped; lower lip 2-partite to the middle, with lanceolate, glabrous or ciliate teeth; upper lip truncate, with 3 very short mucronate teeth, sometimes nearly obtuse; corolla violet, sometimes white, 8–12 mm long, 1½–2 times as long as calyx, sometimes slightly

exserted, 2-lipped, the tube straight, the hood glabrous or hairy; longer filaments with a subulate slightly curved or straight tooth below anthers; style shorter, rarely longer than corolla; nutlets ovoid, ellipsoid, 3-angled, shining, flat on outer side, with 2 parallel nerves at middle, sometimes with a furrow between them and with nerves along the margin, 1.5–2 mm long, ca. 1 mm wide.

Forests, wood margins and glades, coppices, dry meadows, sides of irrigation ditches, shores of lakes. — European part: Kar.-Lap., Balt., Lad.-Ilm., Dv.-Pech., U. Dns., U. Dnp., U.V., V.-Kama, M. Dnp., Bes., Bl. L. Don, Transv., L.V.; Caucasus: Cisc., Dag., W., E. and S. Transc., Tal.; West Siberia: all regions; East Siberia: Yenis., Dau., Lena-Kol. (rarely); Far East: Ze.-Bu., Uss., Sakh., Kamch.; Centr. Asia: Ar.-Casp., Dzu.-Tarb., T. Sh., Balkh., Syr D., Pam.-Al., Mtn. Turkm. **Gen. distr.:** Scand., Centr. Eur., Med., Iran., Bal.-As. Min., Ind.-Him., Jap., Ch. (Sinkiang). Described from Europe. Type in London.

Note. A polymorphous species. The following varieties have been distinguished: 1) var. *hispida* DC. (= *P. hispida* Benth. in Wall. Pl. As. Rar. I (1830) 66), with hairy, hispid stems and entire hispid leaves; 2) var. *pinnatifida* (Pers.) Benth. (*P. pinnatifida* Pers. Syn. II (1819) 137), with incised or dissected cauline leaves, occurring in W. and E. Transcaucasia, sometimes elsewhere throughout the distribution area; 3) var. *polygonifolia* Boriss. (observed near Blagoveshchensk on right bank of Amur River), with 3 very distinct teeth on upper lip of calyx, long style exceeding corolla, long-cuneate leaves; 4) var. *japonica* (Makino) Kudo near hot springs on Kamchatka, a densely hairy, low-growing form (5–15 cm) with densely white-hairy stems, long-petioled bracts and leaves, small dark lilac flowers. This form is also reported for the Kuriles and N. Japan (Kom. Fl. Kamch. III, 58).

2. ***P. grandiflora*** (L.) Jacq. Fl. Austr. IV (1776) 40; Gilib. Fl. Lithuan. II, 90; Benth. Lab. gen. et sp. 417; M. B. Fl. taur.-cauc. II, 67; Kryl. Fl. Zap. Sib. IX, 2335. — *P. vulgaris* β. *grandiflora* L. Sp. pl. (1753) 600. — *B. grandiflora* Moench, Meth. (1794) 414; Benth. in DC. Prodr. XII, 409; Boiss. Fl. or. IV, 692; Briq. in Pflanzenfam. IV, 3a, 241; Shmal'g. Fl. II, 329; Grossg. Fl. Kavk. III, 299. — **Ic.:** Briq. l. c. fig. 86, C–E; Syreishch. Fl. Mosk. gub. III, 113. — **Exs.:** GRF, No. 734; Fl. pol. exs. No. 559.

- 497 Perennial; rhizome creeping, mostly underground; plant glabrous or sparsely hirsute, 15–60 cm high, with ascending stems; leaves long-petioled, oblong or ovate-oblong, entire or rarely, mainly at base, with remote-dentate margin, simple, sometimes pinnatisect; bracts submembranous, orbicular, with cordate base, ciliate at margin, mucronate; inflorescence ovoid or oblong, without paired leaves at base, rarely with one approximate pair of leaves; upper lip of calyx distinctly shortly 3-toothed, the teeth broadly and shortly triangular, mucronate, the lateral teeth slightly longer than the middle tooth; lower lip 2-partite to 1/3 its length, with oblong-lanceolate teeth; corolla 16–27 mm long, 2–4 times as long as calyx, bluish-violet or reddish, with slightly curved tube; longer filaments obtuse at apex, with a short obtuse knob; style longer than corolla; nutlets rounded or rounded-ovoid, ca. 2 mm long, 1.5 mm wide, obtuse at apex, with acute grayish areola at base, glabrous and slightly tuberculate at apex, with a furrow on the back and at the margin, the furrow less distinct on ventral side. June–September.

Forest and forest-steppe mountain belt, dry meadows, chalks, coppices, wood margins, in mountains up to 2400 m. — European part: Balt., U.V., V.-Don, V.-Kama, U. Dnp.,

M. Dnp., Bl., L. Don, Bes., U. Dns., Crim.; Caucasus: Cisc., W. and E. Transc. **Gen. distr.:** Centr. Eur., Med., Bal.-As. Min. Described from W. Europe. Type in London.

Note. A form with pinnatisect leaves (var. *lagovskyi* N. Pop.) occurs in Guria (Caucasus). Hybrid forms between *P. grandiflora* and *P. laciniata* are described as *P. bicolor* Beck. (= *Brunella bicolor* Beck.).

Series 2. *Albae* Boriss. — Corolla yellowish-white; bracts green.

3. *P. laciniata* L. Sp. pl. (1762) 837 et Sp. pl. (1763) 837. — *P. vulgaris* var. *laciniata* L. Sp. pl. (1753) 600; Benth. Lab. gen. et sp. 417. — *P. alba* Pall. ex M. B. Fl. taur.-cauc. 2 (1808) 67. — *Brunella laciniata* Moench, Meth. (1794) 414; Briq. in Pflanzenfam. IV, 3a (1897) 241. — *B. alba* Pall. ex Boiss. Fl. or. IV, 692; Shmal'g. Fl. II, 329. — *B. vulgaris* var. *laciniata* Benth. in DC. Prodr. XII, 411; Grossg. Fl. Kavk. III, 300; Fedch. and Fl. Fl. Evrop. Ross. 811. — **lc.:** Jacq. Fl. Austr. tab. 378; Rchb. Ic. Fl. Germ. XVIII, tab. 1223; Lam. Ill. III, tab. 516, fig. 2; Hegi, Ill. Fl. V, 4, fig. 3254, a-b.

498 Perennial; a hirsute plant, with creeping rhizome; stems ascending, 5-40 cm long; cauline leaves pinnatisect or all entire, lanceolate, or only the lower entire; lower leaves rosulate, petiolate, ovate to elliptic, oblong or lanceolate, entire; upper leaves sometimes toothed or pinnatifid, with linear lobes; bracts membranous, suborbicular; inflorescence spicate, ovoid or oblong, dense; calyx 2-lipped; lower lip 2-partite to more than half its length, the teeth lanceolate-subulate, membranous-ciliate; teeth of upper lip point-tipped; corolla ca. 12 mm long, slightly exceeding calyx, yellowish-white or white, with short exerted tube twice the length of calyx; longer filaments with a curved subulate tooth; style commonly shorter than corolla; nutlets ellipsoid, 2-2.75 mm long, 1-1.5 mm wide, obtuse at apex, with acute white areola at base and with numerous nerves on back. June-August.

Calcareous soils, stony places, open woods, dry valley meadows, scrub on slopes in forest-steppe and steppe belts, up to subalpine belt, mainly in mountainous countries, up to 2500 m. — European part: Bl., Bes., U. Dns., Crim.; Caucasus: Cisc., Dag., W., E. and S. Transc., Tal. **Gen. distr.:** Centr. and S. Eur., Bal.-As. Min., Arm.-Kurd., Iran. Described from W. Europe. Type in London.

Note. The Crimean specimens differ in having more hairy, mostly simple, entire leaves.

The following varieties have been distinguished: 1) var. *pinnatifida* (Koch) Briq. *P. alba* var. *pinnatifida* Koch), with pinnatisect leaves; 2) var. *subintegra* Hamilt. (= var. *integrifolia* Gordon = var. *subintegra* Beck.), with undivided leaves. The hybrid *P. laciniata* and *P. intermedia* Link (Fl. Lusit. I, 1804, 180) = *Brunella intermedia* Stank. (in Izv. Bot. sada, XXVI, 1927, 527).

Subtribe 2. *Melittinae* Briq. in Pflanzenfam. IV, 3a (1895) 207 et 242. — Calyx broadly campanulate, with somewhat prominent network of nerves, 3-4-lobed; corolla dilated, with broad, slightly convex upper lip; stamens 4, didynamous, lower stamens longer than the upper, parallel, ascending under upper lip.

Genus 1262.* **Melittis**** L.

L. Sp. pl. (1753) 597. — *Melissophyllum* Adans. Fam. II (1763) 189.

Calyx broadly campanulate, coriaceous, 2-lipped; upper lip entire or 2-3-toothed; lower lip 2-lobed; corolla with long-exserted tube glabrous within; upper lip entire, concave; lower lip 3-lobed, spreading, the middle lobe slightly larger than lateral lobes; stamens parallel, ascending under upper lip, with divergent anther-cells; style cleft above into 2 equal flat acute lobes; disk nearly regular, with indistinct lobes; nutlets smooth, more or less pubescent, attached by base at apex of disk. Perennial herbaceous plants, with crenate leaves and large flowers in few-flowered verticillasters.

One species distributed in Centr. and S. Europe.

1. **M. melissophyllum** L. Sp. pl. I (1753) 597; Benth. Lab. gen. et sp. 503; in DC. Prodr. II, 432; Ldb. Fl. Ross. III, 400; Shmal'g. Fl. II, 329. — *M. grandiflora* Smith, Fl. Brit. II (1800) 644; Bess. Enum. pl. Volhyn. 70. — *Melissa silvestris* Lam. Fl. Fr. II (1778) 401. — Ic.: Rchb. Ic. bot. III, tab. 241, 242; ej. Ic. Fl. Germ. XVIII, tab. 1202; Fedch. and Fl. Fl. Evrop. Ross. fig. 722; Hegi, Ill. Fl. V, 4, fig. 3326.

Perennial; stems usually solitary, erect, 25-50 (80) cm long, 2-4 mm thick, simple; stems, petioles and pedicels with long, jointed, spreading, more or less retrorse hairs; leaves with petiole 0.6-3 cm long, the blade thin, bright green, with distinct but not prominent network of veins, ovate or oblong-ovate, acute, rounded or cuneate at base, large-toothed, 4 (5)-12 cm long, 2-6.5 cm wide, largest leaves in lower part of inflorescence; hairs on upper side spreading, simple, shorter than on petioles, on lower side only along veins; flowers 1-3 in axils of upper 2-5 pairs of leaves, pedicels 5-12 mm long; calyx 1.5-2 cm long, pale green, broadly campanulate, with 10 non-prominent nerves joined by an irregular network of nerves, covered mainly in lower part and along margin of teeth with long spreading hairs and beset with subsessile and sessile capitate whitish glands; upper lip mostly with 2-3 small teeth; lower lip with 2 equal ovate apiculate teeth; corolla 2.5-4 cm long, usually white, with pink lower lip, rarely plain white, pink or flesh-colored, subglabrous outside or sparsely covered with very short capitate glandular hairs; tube widening nearly from base, approximately twice as long as calyx; lower lip half as long again as upper lip, the lateral lobes ovate, obtuse, the middle lobe widening above, cuneately tapering toward base, with crenate margin; pollen cells diverging at an angle of nearly 180°, broadly ellipsoid, very densely covered outside with minute glands; nutlets 2-3.5 mm long, 1.8-3 mm wide, broadly obovoid or rounded-obovoid, dark brown, covered with spreading hairs, more densely so at apex. Fl. June to first half of July; fr. second half of July to August.

500 Broadleaved, oak, oak-and-pine, mainly open woods, thickets. — European part: Balt. (southern part), U. Dnp. (western part), U. Dns. **Gen. distr.:** Centr. and Atl. Eur. Described from Centr. Europe (Germany, Switzerland). Type in London.

Economic importance. Used in popular medicine as a wound-healing and blood-purifying agent.

* Treatment by A.I. Poyarkova.

** From the Greek *mellitta* or *melissa*, bee, or *mele*, honey. The name occurs in the works of Pliny.

Subtribe 3. Lamiineae Briq. in Pflanzenfam. IV, 3a (1895) 207 et 244. — Calyx tubular, campanulate or infundibular, 5-10-toothed, rarely 2-lipped, 5-10-nerved; corolla with tube included in calyx or exserted, the upper lip usually concave, often hooded, rarely almost flat; stamens 4, didynamous, the lower longer than the upper, parallel, ascending under the upper lip.

Genus 1263.* **Pseuderemostachys**** M. Pop.

In Nov. mem. Mosk. obshch. isp. prir. XIX (1940) 148.

Calyx tubular, narrowly infundibular, with 5 equal subulate teeth; corolla 2-lipped, the tube scarcely exserted from calyx, with ring of sparse hairs nearly under the throat; upper lip of corolla equaling the lower, slightly convex or flat, deeply cleft or 2-lobed; middle lobe of lower lip orbicular-reniform, the lateral lobes shorter, oblong; stamens 4, the filaments very short, very densely and long-villous on inner side, included in corolla-tube, the 2 lower stamens longer; anthers slightly protruding from throat of corolla; anther-cells nearly spreading, confluent at apex; style not exserted, with very uneven branches; nutlets with dense brush of hairs at apex. Perennials; leaves ovate or orbicular-ovate, entire; flowers in 8-10-flowered verticillasters forming a short-ovoid spicate inflorescence.

Endemic Central Asian genus.

1. **P. sewertzowii** (Herd.) M. Pop. in Nov. mem. Mosk. obshch. isp. prir. XIX (1940) 148. — *Eremostachys sewertzowii* Herd. in Bull. Soc. Nat. Mosc. XLI (1868) 392. — *Marrubium sewertzowii* Rgl. in Tr. Bot. sada, IX (1886) 611.

Perennial, 10-15 cm high; root collar white-lanate; stems 1 or 2, covered with short spreading and long 5-7-celled hairs; radical and lower cauline leaves ovate or broadly rounded-ovate, 3-7 cm long, 2.5-3 cm wide; lower floral leaves 3 cm long, 2.5 cm wide, all unevenly crenate-dentate, the upper side rugose, covered with scattered short multicellular and glandular hairs, the lower side prominently veined, more densely covered with 3- or 4-jointed and stellate hairs with uneven rays; petioles of radical leaves dilated, 3-5 cm long, with multicellular and glandular hairs; petioles of lower floral (cauline) leaves broad, horizontally spreading, 2.5-2 cm [sic] long; inflorescence short-ovoid, consisting of 1-2 distant and 2-3 closely approximate 8-10-flowered verticillasters; bracts 17-22 mm long, exceeding calyx, subulate-acicular, dark purple, covered with 3-7-celled spreading hairs, terminating in a glabrous mucro; calyx-teeth narrowly triangular from base, terminating in a dark purple acicular glabrous point 6-8 mm long; tube 12 mm long, covered with 3-5-celled antrorse hairs; corolla purple-lilac, silky-pubescent outside. May-June.

Gravelly mountain slopes, in subalpine and forest-steppe belts. — Centr. Asia: T. Sh. (W.). Endemic. Described from Kara-Tau mountains. Type in Leningrad.

* Treatment by O.E. Knorring.

** From the Greek *pseudos*, false, and the generic name *Eremostachys* (q.v.).

502 Calyx narrowly obconical, with 5 distinct nearly costate nerves extending into subequal spiniform teeth and with 5 indistinct accessory nerves; corolla whitish, 2-lipped, the tube included in calyx, with dense hairy ring below insertion of stamens; upper lip erect, short, subquadrangular, slightly convex; lower lip porrect, large, much longer than upper lip, 3-lobed, the lateral lobes oblong-ovate, entire, the middle lobe nearly obcordate, deeply notched; both lips densely covered outside with long hairs; stamens 4, exerted from corolla-tube, the upper pair slightly shorter than the lower; filaments pubescent; anther-cells spreading, almost confluent at apex, opening by a common slit; style as long as lower stamens, with very short unequal lobes at apex; verticillasters axillary, dense and compact; floral leaves markedly reduced; bracts linear-lanceolate, curved, rigid, spinescent, some connate at base. Subshrubs, with pinnatilobate leaves.

Monotypic Central Asian genus known only from the Kara-Tau mountains.

1. *N. karatavica* Juz. sp. nov. in Addenda XIX, 363. — *Eremostachys karataviensis* M. Pop. et Tekut. in sched. non Knorr.

Subshrub; root woody, very robust and long, branching, ca. 3–4 cm in diameter; stems several, 23–25 cm long, covered at base with densely lanate remnants of petiole bases, strict, robust, obsoletely 4-angled, short-hairy; radical and some cauline leaves oblong, pinnatipartite with deeply dissected, irregularly and obtusely lobulate-dentate lobes, diffusely covered above, rather densely beneath, with shortish hairs and short-stipitate glands, the veins impressed above, prominent beneath; flowers in 1–3 verticillasters, these very dense and compact, many-flowered, very distant, ca. 3 cm in diameter; floral leaves much smaller than the cauline, ca. 5 cm long, deeply pinnatisect, with petiole not longer than calyx; bracts rigid, linear-lanceolate or subulate, falcately curved, spinescent, connate at base (usually 5), as long as calyx, covered with long lanate hairs and short-stipitate glands; flowers ca. 1.4 cm long, calyx ca. 1 cm long, densely covered with stiff hairs, the teeth terminating in a subglabrous point; corolla white, the limb very densely hairy outside; nuts unknown. Time of flowering unknown.

Gravelly fine-earth mountain slopes. — Centr. Asia: T. Sh. (western part: CW Kara-Tau). Endemic. Described from natural boundary Kok-Bel, from collections by G. Tekut'ev, 1936, No. 212. Type in Leningrad.

Note. It is possible that *Pseudomarrubium eremostachyoides* M. Pop. (in Nov. mem. Mosk. obshch. isp. prir. XIX, 1940, 148), whose type we have not been able to investigate, belongs to the synonymy of *N. karatavica*. In any event the short description of this genus and species supplied (in Russian) by Popov in no way resembles the Tekut'ev plant (*Pseudomarrubium eremostachyoides* is credited with capitate inflorescences, flowers similar in structure to those of *Marrubium*, etc.).

* Treatment by S. V. Yuzepchuk.

** Named for S. S. Neustruev, known for his investigation of soils and vegetation of Central Asia.

DIAGNOSES PLANTARUM NOVARUM
IN TOMO XX FLORAE URSS COMMEMORATARUM
(DIAGNOSES OF NEW SPECIES MENTIONED IN VOLUME XX)

Martio 1954

TEUCRIUM L.

1. *T. excelsum* Juz. sp. nov.

Planta basi lignescens et ramosa, caulibus numerosis plerumque erectis vel suberectis saepius elatis 12—45 cm alt., modice robustis, strictis vel paullo flexuosis, pilis sat densis albescentibus patentibus et paullo recurvatis vestitis; folia mediocria vel sat ampla 1.2—3 cm lg. 0.8—2 cm lt., elliptica vel late ovata ca. sesqui longiora quam lata, basi late cuneata vel (superiora) anguste cuneata, apice obtusa vel acutiuscula, irregulariter et grosse inciso crenato-dentata dentibus elongatis oblique sursum directis haud raro duplicatis utrinque 4—7 in numero fere ad dimidium mediae laminae attingentibus, plana, nervis lateralibus utrinque 4—6 plerumque ramificatis supra vix impressis, subtus parum prominentibus, pilis curvatis supra disperse subtus densius albescenti pilosa, sed non velutina; petioli brevissimi, non ultra $\frac{1}{4}$ laminae longitudinem aequantibus, solum in foliis infimis interdum a laminis bene limitati. Folia floralia verticillastrorum infimorum caulinis superioribus similia sensim decrescentia, oblongo rhomboidea basi anguste cuneata acuta, in dimidio superiore acute dentata, superiora oblongo elliptica solum summo apice denticulis acutis paucis praedita subsessilia (fere) plana, suprema haud raro integerrima; axis inflorescentiae modo caulium pilosa; verticillastri 2—5-flori infimi remoti, caeteri valde approximati, racemum laxiusculum vel versus apicem sat densum basi interdum paullo ramosum formantes. Flores 1.3 cm lg., pedicellis mediam longitudinem calycis superantibus; calyx obconicus vel subcampanulatus, viridis vel saepius purpureo violaceus, pilis densis patulis recurvatis mediocribus tectus, dentibus triangularibus longe acutatis longitudine latitudinem sesqui vel duplo superantibus, plerumque solum ad margines et interdum ad nervum principalem pubescentibus; corollae purpureae.

Habitat in declivibus schistosis et in glareosis ad ripas fluviorum in montibus Turcomaniae.

Typus. Montes Kopetdagh occident., in faucibus Aj-Dere, 5 km supra eorum initionem. 26 VI 1931 fl. leg. I. A. Linczevski sub n° 365; in Herb. Inst. bot. Ac. Sc. URSS asservatur.

Affinitas. Species ex affinitate *T. sypsiensis* C. Koch sed foliis gaudens grosse et acute dentatis (fere ut in *T. Chamaedrys*) nec non

* [This appendix has been reproduced photographically from the Russian original.]

506 foliis floralibus solum supremis integerrimis a confinibus distincta. A *T. chamaedrys* L. inflorescentia pro more elongata verticillastris saepius conspicue remotis, foliis floralibus subito decrescentibus omnibus planis imprimis dignoscenda.

2. × **T. Alexeenkoanum** Juz. nov. hybr. (*T. canum* Fisch. et Mey. × *T. nuchense* C. Koch).

Caules pilis modice densis brevibus crispis pilosi; folia basi latiora et dentibus profundius incisus quam in *T. cano* Fisch. et Mey., subtus quoque minus dense pubescentia quam in hoc ultimo, virescentia. Verticillastri plerumque multi-(ad 7-) flori, foliis floralibus brevioribus et latioribus quam in *T. cano*; calyces intense purpureo violacei.

Typus. Daghestania, in regione Kuba ad fl. Ata-Tschai, leg. Alexeenko sub n° 11037; in Herb. Inst. bot. Ac. Sc. URSS conservatur.

3. **T. praemontanum** Klok. sp. nov.

Planta perennis suffruticosa, caespites densiusculos 10—40 cm longos formans. Rami hornotini floriferi 2—10 cm alti, dense canescentes, pilis brevibus (usque ad 0.25 mm longis) adpressis vel subadpressis obtecti; folia caulina oblongo-obovata usque ad linearia, 5—21 mm longa, 1.25—4 mm lata, integerrima, basin versus cuneatim in petiolum breve vel obsoletum attenuata, apice obtusa, margine ± reflexa, subtus albida, tenuiter tomentosa, supra atrovirentia, parciusculè pubescentia (pilis in parte inferiore laminae usque ad 0.5 mm longis); folia floralia (bractae) linearilanceolata, 5—12 mm longa, 0.75—2 mm lata, basin versus petiolatim attenuata, inferiora calyce breviora, superiora breviora. Inflorescentia capitata, congesta, ± 5—15-flora; pedicelli 1—2 (3.5) mm longi, pilis brevibus subadpressis obtecti; calyx subtubulosus 8—9 mm longus, tubo adpresse puberulo, dentibus margine non dense longiciliatis; dentes inferiores calycis lanceolati 2.25—3 mm longi, usque ad 1 mm lati, breviter apiculati, dentes superiores eis breviores et latiores, acute triangulares, inaequales, dens medius 1.75—2 mm longus necnon latus, laterales 1.25—2 mm longi, 1.25—1.5 mm lati, acuminati vel brevissime apiculati, recti vel subreflexi; corolla calyce subduplo longior, albido-flavida, tubulo superne ampliato, fere recto, 5—6 mm longo, labio 7—10 mm longo, lobo terminali rotundato, integerrimo, convexo, lobis lateralibus oblongo-ellipticis, basin versus angustatis, terminali valde minoribus, lobis superioribus oblongo-lingulatis, lateralibus longioribus. Nuculae ovoideae, ca. 1.75 mm longae et 1 mm latae, rugulosi-foveolatae, nigrescentes. Floret VI—VII.

Habitat in decliviis calcareis et cretaceis podolicis.

Typus. RSS Ucr., dit. Ternopoliensis, distr. Berezhaniensis, prope pag. Trostjanetz, in cretaceis, 29 VII 1940, legit M. Danilevskaja; in Herb. Inst. bot. Ac. Sc. RSS Ucr. Kioviae conservatur.

Affinitas. A proximo alpino *T. montano* L. pubescentia longiore

et densiore, foliis longioribus et latioribus dentibus calycis inaequalibus et omnibus brevioribus clare differt; a *T. pannonico* Kern. pubescentia adpressa brevi recedit. (M. Klovov).

SIDERITIS L.

4. *S. Marschalliana* Juz. sp. nov.

Planta suffruticosa radice robusto lignescente apice ramoso, caudice haud alto cortice brunneo tecto a basi vel apice ramoso. Caules floriferi solitarii vel plerumque plures, 25—45 cm alt.; praeterea adsunt caules plures steriles abbreviati annotini rosuliformes. Tota planta et imprimis caules foliaque novella tomento albo accumbente densissime tecta, cana vel nivea; folia radicalia et caulina infima 2—6 cm lg., 0.5—1.2 cm lt., oblongo-spathulata versus basin sensim attenuata, margine obsolete crenulata vel interdum (ubi decalvata) serrulata, apice obtusa vel acutiuscula, ubi decalvata rugosa, petiolis 0.8—2 cm lg.; folia caulina (1.2) 1.5—7.5 cm lg., oblongo-oblancoolata et (suprema) lanceolata, breviter pedicellata et (suprema) sessilia, inferiora plerumque obtusiuscula, superiora acutiuscula vel acuta. Inflorescentia breviuscula vel sat longa, elongato cylindrica 5—20 cm lg., verticillastris (7) 10—18 (22) in numero, sat tenuis vel haud raro crassiuscula, inferne paullo interrupta verticillastro infimo a caeteris 1—2.5 (3) cm remoto, superius (vel interdum ex toto) in spicastrum densum (exinterruptum) conferta; rami laterales nulli vel sat longi inflorescentias accessorias plerumque breviusculas et compactas 4—6 cm lg. gerentes, pedunculo ca. 7 cm lg.; folia floralia (exclusis infimis verticillastrum supra dispositum attingentibus vel haud raro ejus basin paulo superantibus) sat parva vel mediocria, 0.6—1.8 cm lg., 0.7—1.6 cm lt., cordata vel late cordata, infima plerumque sensim, caetera subito in acumem longiusculum vel (superiora) breviusculum sat durum spinescentem calycem attingentem vel superantem contracta, sat firma, papyracea, griseo-viridia dein paullo flavescentia, densiuscule vel haud dense tomentosa, interdum subglabra, anguste albo tomentoso marginata vel interdum fere non marginata, nervis longitudinalibus plus minusve conspicuis, commissuris inter eos parum conspicuis; vicina unius paris sese attingentia vel rarius in parte infima vix obtegentia. Calyx 6.5—9 mm lg., laxe tomentosus dentibus lanceolatis erectis molliusculis dorso nervo longitudinali conspicuo praeditis, tubum calycis subaequantibus vel eo brevioribus exsertis. Corolla 0.9—1.2 cm lg. calycem ad sesqui superans pallide (sulphureo) lutea, fauce villosa, tubo ex toto incluso, extus in parte superiore tomentoso pilosa, labio superiore erecto plano profunde bifido lobis oblongis obtusiusculis, labio inferiore declinato tripartito lobis lateralibus angustis patentibus, medio dilatato integerrimo concavo.

Habitat in cretaceis Tauriae circa oppidum Belogorsk (olim Karassu-bazar).

508 Typus. Tauria, mons Ak-Kaja prope opp. Bielogorsk (olim Karas-subazar), in declivibus cretaceis, 1 VII 1948, fl., leg. S. Juzepczuk (Pl. taur., n° 466).

Affinitas. A specie proxima *S. taurica* Steph. bene differt foliis floralibus submajoribus et latoribus paullo tenuioribus minus dense tomentosis viridibus vel sublutescentibus; a *S. catillari* Juz. inflorescentia sat compacta, foliis floralibus minoribus et firmioribus viridibus vixve lutescentibus.

SCUTELLARIA L.

5. *S. chenopodiifolia* Juz. sp. nov.

Suffrutex surculis lignescentibus anni praecedentis (in planta viva ut videtur sub sabula occultatis) praedita, caulibus annotinis sat robustis ex lutescenti pallide viridibus 20—35 cm altis; folia 1—2.5 cm longa 0.5—1.5 cm lata ovata vel sat late ovata, apice obtusa, haud profunde et grosse crenato dentata vel superiora subintegerrima, crassiuscula, utrinque viridia supra fere glabra subtus pilis dispersis minimis papilliformibus tecta. Bractee ovatae inferiores obtusiusculae fere planae, superiores breviuscule acuminatae naviculiformes leviter et breviter tomentoso pubescentes pallide virides. Calyces fructiferi pallide virides non rubescentes. Corollae non ultra 2 cm longae, saturate luteae. Caeterum *S. naviculari* Juz. similis. VI.

Habitat in sabulosis Asiae mediae in ditione lacus Balchasch.

Typus et isotypus. In valle fl. Kurtu, in sabulosis ad ripam sinistram inter locum dictum Sary-Kemir et Karassu. 10 VII 1926, fl. et fr. leg. V. S. Titov et A. F. Joffe sub n°n° 347 et 350; in Herb. Universitatis Asiae mediae conservantur.

Affinitas. *S. naviculari* Juz. valde affinis, sed notis in diagnosi allatis diversa.

6. *S. flabellulata* Juz. sp. nov.

Radix verticalis lignescens; caudex brevis nodosus caudiculos plures flexuosos ramosos pallidos efficiens, superne in caules annotinos ascendentes violascentes foliatis 4—10 cm lg. abiens pilis densis breviusculis curvatis tectos, internodiis abbreviatis; folia dense disposita, minuscula 0.4—1 cm lg., 0.3—1 cm lt., late ovata vel rotundato-rhomboidae, basi late cuneata, apice obtusiuscula, dentibus utrinque 3—6 parvis inciso crenatis, utrinque breviter et grosse griseo tomentosa, nervis supra valde impressis subtus valde prominentibus flabellatim dispositis; petiolis 1.5 mm lg. densissime breviter patule pilosis. Inflorescentia ca. 1.5—2 cm lg., tempore florendi densiuscula; bractee inferiores ca. 1 cm lg. et 4 mm lt., ovato-lanceolatae obtusiusculae, arcuatim curvatae et naviculiformiter plicatae, violascenti purpurascentes, inferiores dentibus singulis acutis praeditae, superiores integerrimae, pilis densis breviusculis curvatis tectae margine

509 *longiuscule patulo albo ciliatae*. Calyx parvus dense villosus, fructifer ca. 4 mm lg. Corolla 0.7—1.5 cm lg., inamoena, sordide flavescentis labio superiore superne violascenti purpureo, labio inferiore maculis et lineolis, tubo lineolis tenuibus ejusdem colore notatis, extus dense breviter patulo pilosa et stipitato glandulosa. VIII.

Habitat in declivibus, in calcareis et in schistosis montium Tian-Schan occidentalis.

Typus. Kasachstania australis, in regione Tjulkubass, prope pag. Novo-Nikolaevka, Alatau talassicum, fl. Ulkun Kaindy superius in schistosis, 2500 m 11 IX 1947, fl., leg. Voroschilov sub n° 2433; in Herb. Inst. bot. Ac. Sc. URSS conservatur. Paratype: jugum Alatau talassicum in reservato Aksu-Dzhebogly in summo vertice traject. Ulkun et Kschi-Kaindy, in declivibus meridionalibus, ad vallem fl. Kschi-Aksu spectantibus, 3000 m supra mare, solo glareoso subargilloso 11 IX 1947 fl. fr. G. V. Mike-schin; Reservat. Aksu-Dzhebogly in valle fl. Kschi-Aksu in declivibus meridionalibus prope traject. ad vallem Dzhebogly, 2500 m supra m., in calcareis 30 VIII 1944 fl. fr. M. K... (illegibile).

Affinitas. Affinis *S. pictae* Juz., a qua differt caulibus breviuscule curvatim pilosis (neque longe et molliter patulo pilosis), floribus minoribus non ultra 1.5 cm lg. sordide flavescentibus.

7. *S. soongorica* Juz. sp. nov.

Radix lignescens flexuosa; caudex abbreviatus ramosissimus, caules numerosos edens 15—30 cm alt. ascendentes vel suberectos flexuosos haud dense vel sparse breviter crispato-villosos, haud coloratos (i. e. virides) vel violascentes; folia parva 0.5—1.5 cm lg., 0.2—0.8 cm lt., anguste triangulari-ovata vel oblonga basi truncata vel plerumque cuneata, apice acutiuscula, profunde (fere ad dimidium mediae laminae latitudinis) inciso dentata dentibus utrinque 4—7 sat aequalibus elongatis apice rotundatis, oblique suberectis et paulo recurvatis, supra griseo-viridia, disperse tenuiter breviter tomentosa, subtus ob tomentum tenuissimum appressum albescentia, nervis prominentibus, petiolis sat longis et tenuibus tomentosis ad 1 cm longis. Inflorescentia initio brevis, ad finem valde elongata laxiuscula; bractae fere membranaceae 0.6—1 cm lg., 0.4—0.8 cm lt. ovatae vel anguste ovatae, breviter vel sat longe acutatae, valde convexae, tota superficie et imprimis marginibus densiuscule et longe patulo-pilosae, admixtis glandulis breviter stipitatis, pallide virides, hic et illic haud raro violaceo suffusae; calyx tempore florendi 2—3 mm lg. pilosus et glandulosus, fructifer scutello ca. 3—4 mm lg.; corolla comparative parva, 1.4—1.7 cm lg., lutea, labio inferiore plerumque macula violacea notato, extus pilosa et glandulosa; nuculae ca. 1 mm lg. ovatae, ob pubescentiam densam brevem albescentes. VI—VII.

Habitat in glareosis et arenosis ad ripas fluminum Asiae mediae (Soongoria).

Typus. Desertum soongoro-kirghisicum, m. Alatau ad fl. Lepsa, 510 fl., leg. Karelina et Kirilow; in Herb. Inst. bot. Ac. Sc. URSS asservatur.

Affinitas. A proxima *S. transiliensi* Juz. differt foliis parvis, dentibus regularibus obtusis, floribus plus quam duplo minoribus.

8. *S. oschtenica* Juz. sp. nov.

Planta inter *S. oreophilam* Grossh. et *S. polyodon* Juz. quasi medians habitu generali *S. oreophila*, sed bracteis fere omnino glabrescentibus quoad formam quoque magis eis *S. polyodon* Juz. similibus. Inflorescentia brevissima pauciflora subglobosa, fructifera quoad dimensiones et formam fere immutata.

Habitat in declivibus montis Oshten Ciscaucasiae.

Typus. Caucasus Occidentalis, Reservatum Publicum Caucasicum, in detritu ad declivia orientalia montis Oshten. 12. VIII. 1929, fl. fr.; in Herb. Inst. bot. Ac. Sc. URSS conservatur.

9. *S. tschimganica* Juz. sp. nov.

Proxima *S. haematochlorae* Juz. s. str., sed ab ea notis sequentibus diversa: caules himiliores 7—25 cm alt.; folia minora et angustiora, ad 2 cm lg. et 1.4 cm lt., ovata vel anguste rhomboidea basi cuneata dentibus utrinque 3—7, subtus levissime breviter tomentosa (singula interdum subglabra), petiolis brevioribus. Inflorescentia 2—3 cm lg., fructifera non ultra 4 cm lg., laxiuscula; bractee anguste ovatae in acumen plerumque non recurvatum sensim angustatae, inter nervos leviter pilosae vel subglabrae. Caeterum *S. haematochlorae* Juz. similis.

Habitat in declivibus siccis herbosis montium Tian-Schan occidentalis.

Typus. In declivibus herbosis montis B. Tshimgan. 5 VI 1914, fl., leg. Z. Minkwitz sub n° 1219. Paratypi. In declivibus lapidosis siccis montis B. Tshimgan eodem tempore fl. idem sub n° 1235; Tshimgan, 8 V 1916 fl., leg. V. Lipsky.

10. *S. Minkwitziae* Juz. hybr. nov. (*S. tschimganica* Juz. \times *S. microdasys* Juz.).

Similis *S. tschimganicae* Juz. a qua differt foliis parvisculis et imprimis bracteis angustioribus ovato lanceolatis sensim acutatis pallide viridibus pubescentia e pilis brevissimis curvatis accumbentibus constante tectis admixtis glandulis breviter stipitatis vel subsessilibus, ut quoque floribus minoribus non ultra 2 cm lg.

Typus et isotypi: syst. fl. Tschirtschik, in valle fl. Ugam, loco dicto Kizyl-Tal 18—19 V—VI 1914, fl. fr. Z. Minkwitz sub n° 715.

11. *S. urticifolia* Juz. et Vved.

Caudex sicut bases caulium lignescens; rami annotini suberecti pallide virides vel pallide violacei pilis minimis curvatis pubescentes; folia 1—3.2 cm lg., 0.6—1.8 cm lt., ovata basi late cuneata apice acuta,

511 **grosse** inciso crenata dentibus utrinque 5—7 oblique sursum directis, utrinque viridia, supra glabra subtus vix conspicue brevissime tomentosa vel interdum subglabra coloratione anthocyanica nulla; petiolis breviusculis vel brevibus, 1—8 mm lg., parce tomentosis eglandulosis. Inflorescentia ca. 4 cm, fructifera ad 7 cm lg., sat compacta; bracteae pallide virides, comparative parvae, vulgo non ultra 1 cm lg. et lt., late ovatae vel subrotundatae, apice breviter et subito acuminatae, inferiores margine haud raro remote dentatae, pilis copiosis longis patentibus simplicibus et glandulis stipitatis notabiliter brevioribus vestitae; corollae ca. 2.5 cm lg., tubo latiusculo luteo extus breviter stipitato glanduloso.

Habitat in declivibus collium (solo argilloso lapidoso) Asiae mediae (jugum Fergana).

Typus. Tian-Schan occident., praemont. jugi Fergana, in vicin. pag. Gava, in declivibus meridionalibus collis, solo argilloso lapidoso 7 VI 1928, fl. fr., leg. L. Kryltzova sub n° 101; in Herb. Universitatis Asiae mediae conservatur. Paratypi. Ibidem eodemque tempore a L. Kryltzova sub n° 74 et 94 lecti sunt.

Affinitas. *S. adenostegiam* Briq. et *S. bucharicam* Juz. nonnihil admonet, sed jam primo intuitu diversa foliis subconcoloribus supra glabris, subtus tomentulo brevissimo vix conspicuo tectis, grosse et irregulariter crenato dentatis dentibus utrinque 5—7 (neque ad 10) in numero

12. **S. angrenica** Juz. et Vved. sp. nov.

Similis *S. pycnocladae* Juz., sed ramis erectioribus, longius et laxius (interdum patule) pubescentibus; folia angustiora, basi angustius cuneata, acutiuscula vel acuta dentibus profundius incisus acutiusculis oblique suberectis, margine non revolutis, supra minus dense pilosa. Bracteae quam in *S. pycnoclada* angustiores et acutiores. Corollae haud magnae ca. 2 cm lg., extus stipitato-glandulosae. Reliqua *S. pycnocladae* Juz.

Habitat in declivibus schistosis, in collibus lapidoso arenosis et in steppis agropyrosis Asiae mediae (Tian-Schan occident., bass. fl. Angren).

Typus. Tian-Schan occident., in declivibus septentrionalibus jugi Kuraminski, Lailak-saj. 21 VI 1940, defl. fl., leg. A. Usmanov sub n° 663; in Herb. Univ. Asiae mediae conservatur. Paratypi. Ibidem, 19 VI 1940 fr. idem sub n° 610, 614; bass. fl. Angren, in declivibus septentrionalibus, in steppa agropyrosa 16 II 1940 nondum fl., leg. E. Korotkova sub n° 115; ibidem, Lasharak-saj, in declivibus meridionalibus; eodem tempore, fr., idem sub n° 101.

Affinitas. Cfr. supra.

13. **S. Popovii** Vved. sp. nov.

Perennis, radice sat tenui. Caudices plures herbacei tenues ramosi inter lapides repentes, radicantes. Caules e ramis caudicium solitarii adscendentes tenues simplices breves glandulis sessilibus stipitatisque

et pilis longis papillaribus flexuosis patentissimis tecti. Folia late triangulari-ovata vel late-ovata, saepe sublitoria quam longa, grosse paucicrenata, 512 obtusa, e truncata vel latissime cuneata basi in petiolum eis subaequilongum ut caulis vestitum subito attenuata, utrinque glandulis stipitatis pilisque longis papillaribus dense tecta, summa saepe bracteis infimis similia. Inflorescentia capitata ca. 5—10-flora. Bractee foliis tenuiores violaceo coloratae, elliptico-rhombeae, acutiusculae vel obtusiusculae, indumento foliis similes, infimae saepe ambitu late rhomboideae superne paucicrenatae dentatae. Calyx longe dense pilosus et stipitato glandulosus, appendice reniformi, 2.5—3 mm lata, 1.5—1.75 mm alta instructus. Corolla flavida, labio superiore apice et lobis lateralibus pupureis, labio inferiore purpureo maculato, 23—25 mm longa, glandulis stipitatis pilisque longis sublanatula, ima basi incurva, tubo apicem versus sensim dilatato, 18—19 mm longo.

Habitat in summis montibus Kirghizicis (olim Alexandri) et Talas-Alatau (Tian-Schan septentrionalis).

Typus. Montes Alexandri ad fl. Ak-Su, ad schistosa mobilia in regione alpina montis Dshaman-itschke. 1924 VIII 7, fl. Mokeeva et Popov (in Herb. Fl. Asiae mediae sub n° 202 nomine *S. physocalycis* editus, exclusis calycibus e jugo Alaico submaturis additis; in Herb. Univers. Asiae mediae sub n° 17011 conservatur).

Affinitas. Species affinissima *S. talassica* Juz. a specie nova foliis angustioribus angustius cuneatis incisius crenatis brevius pilosis et florum colore differt. (A. Vvedensky).

14. *S. subcordata* Juz. sp. nov.

Suffrutex 8—20 cm alt. habitu *S. Linczevskii* Juz. similis; caules foliiferi minus dense et comparative breviter pubescentes, pilis curvatis vel crispatis, interdum fere tomentosi, plerumque non colorati; folia 1—2.5 cm lg., 0.4—2.2(2.6) cm lt., ovata usque rotundata, saltem inferiora basi haud profunde cordata, caetera saepius truncata vel late cuneata, apice obtusa vel rotundata, raro acutiuscula, margine majusculae et grosse obtuse vel rotundato crenato dentata dentibus vel crenis utrinque 5—8 inaequalibus, utrinque viridia, disperse et breviter crispato-pilosa (pilis in pagina superiore magis erectis et fere accumbentibus); nervis principalibus plerumque a basi foliorum arcuatim divergentibus, modice impressis (supra) vel elevatis (subtus); petiolis 1.5—12 mm longis, molliter crispato pilosis. Inflorescentia 3—4.5 cm longa, latiuscula; bractee 1—1.5 cm lg., 0.4—0.8 cm lt., ovatae, obtusae, fere planae, nervis longitudinalibus leviter prominentibus, haud dense longe patulo-pilosae admixtis glandulis stipitatis, virides, subherbaceae; calyx tempore florendi ca. 2.5 mm lg., longe et molliter pilosus; corolla 2.2—2.7 cm lg. tubo sat longo, luteo, labio inferiore macula obscura notato, extus plerumque leviter longe stipitato glandulosa. VII.

Habitat in rupibus et in schistosis regionum subalpinae et alpinae montium Tian-Schan occidentalis (Alatau kirghizicum).

513 Typus. Alatau kirghizicum, adversus Akyr-Tjube, prope Taldybulak, in regione alpina 14 VII 1924, fl. fr. M. Popov et E. Mokeeva; in Herb. Universitatis Asiae mediae conservatur. Paratypi: Jugum kirghizicum, Kan-Dzhajlau in parte ejus occidentali, in rupibus juxta rivum 22 VII 1922 fl. E. Korovin sub n° 1606; in declivibus meridionalibus jugi Alatau kirghizici, fl. Neldy-Su, in schistosis 24 VII 1922, fl. idem sub n° 1669.

Affinitas. Species *S. Linczevskii* proxima a qua imprimis pubescentia aliena differt; nonnullis characteribus ad *S. Knorringiae* Juz. vergit, quacum forsitan sicut aliae species seriei *Subcordatae* Juz. phylogenetice ligata; a hac ultima specie differt caulibus numerosis, foliis minoribus, eorum pubescentia uberiore eglandulosa, floribus subminoribus.

15. **S. lanipes** Juz. sp. nov.

S. subcaespitosae Pavl. valde affinis; differt ab ea habitu (modo crescentiae) paullo diverso atque pubescentia; caudicis ramificationes relative pauci elongati, cur planta caespites non format; caules annotini fere erecti, ca. 10 cm alti, densissime et longe patule pilosi, subvillosi; folia ovata vel late ovata basi truncata vel laeviter cordata utrinque griseo viridia ob pubescentiam densissimam paullo crispatam subtus fere imperfecte tomentosa; petioli sicut folia juvenilia (nondum evoluta) dense et longe lanuginoso villosi pubescentes. Bractee vulgo non ultra 1 cm longae ovato-ellipticae vel sat late-ovatae, acutiusculae, fere villosae; corolla ignota. Reliqua *S. subcaespitosae* Pavl.

Habitat in declivibus montium jugi Itschkele-Tau Asiae mediae, solo lapidoso.

Typus. Jugi Itschkele-Tau pars orientalis, declivia septentrionalia, solo lapidoso, 4 VIII (anno?) fr. leg. S. Kudrjashev sub n° 907. Paratypus. Jugum Alatau Kirghizicum, declivia meridionalia, bass. fl. Kaindy 1 VII (anno?) fr. leg. S. Kudrjashev sub n° 703.

Affinitas. Planta habitu et pubescentia *S. Linczevskii* Juz. aemulat, sed nervationi foliorum hujus ultimae flabelliformi caret.

16. **S. Alexeenkoi** Juz. sp. nov.

Suffrutex caudice sat robusto valde ramoso, caulibus numerosis crassiusculis ascendentibus et arcuatim vel subgeniculatim curvatis plerumque simplicibus 8—20 cm alt., pilis horizontaliter patentibus duomodi dense tectis—brevibus et longis; hi ultimi copiosissimi molles paullo flexuosi; internodia breviter vel mediocria; folia majuscula ad 4 cm lg. et 2.5 cm lt., ovata vel late ovata, basi truncata vel interdum breviter cordata, apice obtusa, haud profunde et minuscule crenato-dentata, dentibus utrinque 5—8 in numero; utrinque viridia, plus minus dense

514 *breviuscule pilosa*, petiolis 0.5—1.2 cm lg. Inflorescentia ca. 4—5, interdum ad 8 cm lg., sat densa; bractae ad 1.8 cm lg. et 1 cm lt., oblongo-ovatae, persistentes, subfoliaceae integerrimae vel dentibus singulis praeditae, pilis longis et brevibus patulis dense tectae admixtis glandulis stipitatis, pallide virides. Calyx tempore florendi parvus, non ultra 3 mm lg., villosus pilosus et glandulosus, fructifer scutello incluso ad 1 cm lg., hoc ultimum subglabrum. Corolla ampla, ca. 3 cm lg., tubo comparative tenui, lutea, labio superiore apice sicut lobis lateralibus obscure purpureis, labio inferiore violaceo picto, haud raro bimaculato, extus breviter pilosa et stipitata glandulosa; nulae angulato-ovatae, ca. 1.5 mm longae coerulescentes tomentulo stellato dense et ex toto tectae.

Habitat in declivibus herbosis montium Asiae mediae (jugum Alai).

Typus. Prov. Fergana, prope st. Langar ad fl. Taldyk, in declivibus orientalibus 21 VI 1906, fr., leg. Alexeenko sub n° 851. *Paratypus*. Schachimardan, in monte, 8 VI 1948, fl., leg. Schafeev.

Affinitas. Species *S. xanthosiphon* Juz. cum *S. ocellata* Juz. connectens, a caeteris speciebus seriei *Subcaespitosae* pubescentia paullo aliena diversa.

17. *S. velutina* Juz. et Vved. sp. nov.

Planta *S. hissaricae* B. Fedtsch. simillima sed ab ea jam primo intuitu diversa ob pubescentiam characteristicam omnium partium e pilis mollibus breviusculis patentibus constante rectis crispatisve, imprimis densissimam in pagina inferiore foliorum ideo velutina et albescente. Inflorescentia erecta vel paulo curvata elongata; verticillastri remoti internodiis 0.5—2.5 cm longis. Calyx duomodi pubescentia tectus: e pilis breviusculis ejusdem typi ac in caeteris plantae partibus et e pilis minus densis longis constante. Reliqua *S. hissaricae*. VI.

Habitat (ut videtur) in abruptis rupium jugi Hissarici in Asia media.

Typus. RSS Tadz., jugum Hissaricum in valle fluminis Varzob 5—10 VI 1930 fl. fr., leg. V. Titov; in Herb. Universitatis Asiae mediae conservatur.

Affinitas. Pubescentiae indole *S. holosericeam* Gontsch. valde revocat, sed ab ea rite dignoscitur inflorescentia aliena verticillastris notabiliter remotis et revera ad aliam affinitatem spectat.

18. *S. andrachnoides* Vved. sp. nov.

Radix lignosa caudices suberosos plures breves multicaules emmitens. Caules graciles suberecti pube appressa densa, interdum pilis sparsis longis patentibus tecti, 10—20 cm alti. Folia sat tenera, subtus nervis prominentibus, late ovata vel elliptico-ovata, integra vel rarius obsolete paucidentata, obtusa vel obtusiuscula, e truncata vel late cuneata basi in petiolum aequilongum (in inferioribus) vel duplo breviorum (in mediis)

sensim angustata vel superiora subsessilia, utrinque pube densissima appressa glandulisque sessilibus et interdum pilis longis sparsissimis patentibus grisea, demum interdum glabrescentia, (5)10—15(20) mm lata.

515 Inflorescentia densa oblonga, ad 2.5 cm longa. Bracteae pallidae anguste rhomboideo-ellipticae vel rhomboideo-ellipticae, integrae, acutiusculae, subtus nervis tribus flabellatim valde prominentibus, utrinque glandulis sessilibus stipitatisve pilisque longissimis praecipue marginem versus obsitae, 6—8 mm longae. Calyx ca. 2 mm longus (fructifer 3 mm lg.) pliciformiter appendiculatus, glandulis sessilibus stipitatisque et pilis longis patentibus tectus. Corolla pallide lutea labio inferiore purpureo maculato, 9—10 mm longa, tubo tenui paullo incurvo 6—7 mm longo, glandulis sessilibus et breviter stipitatis tecta, labio superiore supra pilis longis barbato. Nuculae atrobrunneae, foveolato-tuberculatae, glabrae, ca. 0.75 mm longae.

Habitat in rupibus ad fl. Naryn in loco Isch-Saj (Tian-Schan centralis).

Typus. Fl. Naryn, loco dicto Isch-Saj, in rupibus, 10 IX 1927 fl. et fr. Abolin sub n° 684; in Herb. Universitatis Asiae mediae conservatur.

Affinitas. Inter *Apeltanthos* floribus minoribus, ab altera parviflora *S. baldshuanica* Nevski indumento et praecipue bractearum indole, bene differt. (A. Vvedensky).

19. *S. macrodonta* Juz. sp. nov.

Similis et proxima *S. poëcilanthae* Nevski sed foliis utrinque dentibus ad 3 in numero magnis apice obtusis rotundatis praeditis diversa; bracteae quam in *S. poëcilantha* latiores et acutiores; flores inter minimos generis, ca. 1 cm lg. Reliqua *S. poëcilanthae* Nevski.

Habitat in rupibus graniticis Asiae mediae, in jugo Hissarico.

Typus. In valle fl. Sardai-Mion, infra pag. Vistan, leg. B. A. Fedtschenko sub n° 506; in Herb. Inst. bot. Ac. Sc. URSS conservatur.

Affinitas. Vide supra.

20. Subfamilia **Drepanocaryoideae** Pojark. subfam. nov.

Calyx tubulosus 18—20-nervius, ore fere recto, basi oblique inflatus. Corolla bilobiata, labio superiore bilobato, labio inferiore trilobato. Stamina 4, antherarum loculis sub angulo obtuso, 180° excedente, divaricatis, verticibus ad filamentum revertibus inter se divergentibus. Ovarium 4-partitum; stylus basalis: inter ovarii lobos ad eorum basin insertus. Nuculae longitudinaliter falcatis incurvae (ventre valde concavae, dorso convexae hemisphaericae), insidentes in disci excrescentiis (gynophorum 4-partitum) semilunaribus (tempore fructus maturitatis induratis) disci lobis ligulatis glanduliferis alternantibus, areola basali-ventrali magna, fere totam superficiem ventralem occupante; disci lobi tempore fructificationis fere

516 **inconspicui.** Embryo fere rectus, cotyledonibus carnosulis, radicula basi cotyledonum orta, deorsum (ad hilum) spectante.

Typus subfamiliae (monotypicae): genus *Drepanocaryum* Pojark.

21. **Drepanocaryum** Pojark. gen. nov.

Calyx rectus basi oblique inflatus, exanulatus, ore fere recto, dentibus inferioribus duobus ceteris angustioribus et paulo longioribus. Corollae tubus intus glaber, labium superius bilobatus erectus, labii inferioris lobi laterales erecti, lobus medius planus sursum convertens. Stamina sub corollae labio superiore disposita, suberecta, omnia fertilia, posteriora anterioribus longiora, antherarum loculis non confluentibus. Stylus inaequaliter lobatus. Nuculae grosse tuberculatae. Plantae annuae, floribus in cymas remotas dispositis.

Genus monotypicum Asiae mediae proprium.

Species unica: *D. Sewerzowii* (Rgl.) Pojark.

MARRUBIUM L.

22. **M. Turkeviczii** Knorr. sp. nov.

Planta 35—40 cm alta, basi lignosa; caules pauci graciles subcurvati, purpureo-fusci, pilis simplicibus et fasciculatis tecti; folia inferiora et caulina ovata ad apicem breviter rotundato-dentata petiolata petiolis 2—3 cm longis, superiora oblonga ad basin angustata; folia floralia breviter petiolata ut caulina superiora verticillis 3—4-plo longiora, supra lucide viridia, pilis setosis et stellatis radio elongato sparse vestita, subtus pilis stellatis radio elongato, grisea et praeterea longe pilosa. Flores 7—10 in verticillis distantibus quorum duo-tres superiores approximati; bracteae calyci aequilongae, longe pilosae; calyx nervis subprominulis, dentibus 5 rectis subulatis apice acuminatis, a basi ad apicem glabram longe pilosis; tubo pilis stellatis et stellatis radio elongato tecto; corolla lilacina tubo calyce exserto, basi glabro, fauce stellato-piloso; labio superiore quam inferius longiore in lobos duos oblongos profunde inciso, labio inferiore lobo medio late ovato et lobis lateralibus oblongo-ovatis; nuculae obscure fuscae, ellipticae, triangulares, tuberculatae.

Habitat ad rupes Transcaucasiae australis.

Typus. Prov. Kars, declivitates ad flumen Arax. 8 V 1914 n° 166 legit S. Turkevicz; in herb. Leninopolitano asservatur.

Ab affini *M. goktschaico* N. Pop. foliis tantum in parte superiore breviter et laxe dentatis (non macrodentatis) verticillastris 3—4-plo folia floralia oblonga superantibus (non paulo superantibus) calyce et foliis pilis stellatis hirsutisque vestitis (non pilis latis tenuibus longisque) calyce dentibus tubo 2—2.5-plo brevioribus valde differt.

NEPETA L.

- 517 23. Sectio **Glechomanthe** Pojark. sect. nov. — Calyx ore obliquo, corolla tubo longo, sursum sensim ampliato, limbo brevi, labii superioris lobo medio plano (basi non inflato) late unguiculato vel in basin latam gradatim angustato, lobis lateralibus ovatis magnis labio superiori aequilongis et lobis eius aequilatis; stamina anteriora quam posteriora multo breviora antheris e fauce vix vel non exsertis, rarius posterioribus paulo breviora antheris sub labio superiore approximatis. Verticillastri pauciflori, dissiti vel in capitulum terminale congesti. Plantae perennes.

Sectio montibus Asiae mediae et Himalayae propria.

Typus sectionis: *N. longibracteata* Benth.

24. Subsectio **Callistegiae** Pojark. subsect. nov. — Verticillastri in capitulum terminale densum congesti; folia floralia caulinis similia; folia verticillastos fulcrantia ut bracteae floribus longiora, colorata; calyx obconicus ore valde obliquo vel bilabiato; stamina anteriora posterioribus multo longiora, antheris ad faucis marginem dispositis, loculis sub angulo fere recto divergentibus; nuculae laeves. Plantae alpinae humiles, foliis cuneatis, margine profunde undulato crenatis, caulibus pluribus, partibus subterraneis foliis squamiformibus dense vestitis.

Typus subsectionis: *N. longibracteata* Benth.

25. Subsectio **Brachystegiae** Pojark. subsect. nov. — Verticillastri pauci (1—5)-flori distantes; folia floralia caulinis similia sed suprema valde diminuta; bracteae lanceolatae calyce breviores; calyx obconicus ore obliquo; stamina anteriora superioribus multo breviora, antheris ad faucis marginem dispositis vel subinclusis loculis sub angulo fere recto divergentibus. Nuculae leviter disperse rugulosae, apice acutatae. Plantae perennes rhizomate lignoso valde incrassato, foliis sessilibus.

Typus subsectionis (monotypicae): *N. glutinosa* Benth.

26. Subsectio **Catantherae** Pojark. subsect. nov. — Flores in verticillastos dissitos dispositi, verticillastri superiores tantum subcapitatum approximati. Folia floralia caulinis conformia, sed superiora valde diminuta; bracteae lineari-subulatae calyce multo breviores. Calyx tubulosus vel tubuloso-obconicus, ore obliquo vel bilabiato; stamina anteriora superioribus paulo breviora, antherarum loculi sub angulo ca. 180° divaricati. Nuculae minute mamillatae.

Duae species Asiae mediae propriae.

Typus subsectionis: *N. Knorringiana* Pojark.

27. **N. Knorringiana** Pojark. sp. nov.

Perennis; rhizomate obliquo ca. 1 cm diam. foliorum squamiformium atrofuscorum reliquiis vestito; caules 13—25 cm alti, tenues (0.7—1.3 mm

518 **crassi**) suberecti simplices, dense foliati, internodiis ad 3.5—4 cm longis, pilis tenuibus patentibus albis pubescentes; folia firma glaucescentia, utrinque glandulis planis resinosis copiosis tecta et insuper pilis eglandulosis tenuibus supra sparsim, subtus, praecipue ad nervos, satis dense obsita et hic glandulis sessilibus capitatis haud copiosis intermixtis, caulina ambitu triangulari-ovata, basi cordata vel superiora truncata, obtusa vel acutiuscula, margine utrinque dentibus magnis triangularibus plerumque acutis instructa, media quam cetera maxima, 1.3—2 cm longa et 1—1.8 cm lata; folia floralia inferiora caulinis similia, caetera decrescentia ovata vel rhomboideo-ovata, acuta, dentata. Verticillastri ad apicem caulis laxè approximati, inferiores 1—2 tantum dissiti; semiverticillastri 2—5-flori breviter pedunculati (pedunculis superioribus 3—5 mm inferioribus 8—10 mm longis), pedicelli 0.5—1.5 mm longi; folia semiverticillastos fulcrantia (ut bracteae) lineari-subulata plicata, tenuiter breviterque pubescentia; bracteae calyce 3—3.5-plo breviores; calyx 8—9 mm longus, violaceus, 15-nervius, pilis eglandulosis patentibus 3—5-cellularibus glandulis sessilibus capitatis paucis nonnunquam intermixtis tectus, tubulosus, ore obliquo, dentibus rectis lanceolatis sensim acutatis fere aequalibus, superioribus tubo ca. 2.5-plo brevioribus; corolla 20—24 mm longa, extus sparse pubescens, tubo calyce duplo longiore superne curvato et ampliato, labiis in sicco roseis, superiore 3—4 mm longo ad $\frac{1}{3}$ in lobos latos fissus; labii inferioris lobo medio cuneato-flabelliformi in basin latam sensim angustato, apice emarginato et inconspicue paucicrenato, lobis lateralibus ovatis 2.5—3 mm longis, 1.7—2.5 mm latis; stamina posteriora ut stylus labio superiori aequilonga, stamina anteriora posterioribus paulo breviora; antherae sub angulo ca. 180° divaricatae, late ellipticae. Nuculae 1.6—1.8 mm longae, 0.7 mm latae, fuscae, ellipsoideae, trigonae, ventre costatae, apice acuminatae, utrinque sparse apice tantum crebre mamillatae.

Habitat in declivibus lapidosis in regione alpina partis orientalis jugi Alaici.

Typus. Asia media, jugum Alaicum, ad fl. Tar (in fluvium Kara-Kuldsha influens) inter Kara-Tasch et Oi-Tal, 13 VI 1913, fl. et fr. N. Tuturin, n° 160 (in Herb. Inst. bot. Ac. Sc. URSS conservatur).

Affinitas. Valde affinis *N. subhastatae* Rgl. a qua calyce tubuloso (non obconico), ore obliquo (non bilabiato), dentibus rectis sensim acuminatis (non in acumen curvatum subito contractis), inflorescentia laxa nec non nuculae sculptura bene differt.

28. Subsectio **Podocephalae** Pojark. subsect. nov. — Semiverticillastri omnes pedunculo elongato instructi vel supremi nonnunquam tantum sessiles; inflorescentia laxa racemosa vel paniculata. Calycis os valde obliquum, fere bilabiatum.

Typus subsectionis: *N. floccosa* Benth.

519 29. Subsectio **Apodocephalae** Pojark. subsect. nov. — Semiverticillastri sessiles subsessilesve, inferi tantum breviter pedunculati. Inflorescentia interrupte spicata. Calycis os obliquum.

Species duae Asiae mediae propriae.

Typus subsectionis: *N. ladanolens* Lipsky.

30. **N. consanguinea** Pojark. sp. nov.

Perennis; radix crassa lignosa; caules erecti 65—100 cm alti, ca. 5 mm crassi, glandulis capitatis minutissimis albescentibus imprimis dense in parte superiore tecti et insuper pilis patentibus eglandulosis albis, inferne plerumque longis et crebris, vestiti, valde ramosi, ramis axillaribus longis fertilibus iteratim ramosis; folia infima fusca squamiformia sessilia, cetera caulina viridia, petiolata, petiolo sub angulo acuto rarius fere recto patente lamina 3.5—5-plo brevior; lamina utrinque indumento molli e pilis brevibus subappressis tenuibus (subtus denso cinereo subvelutino, supra laxo) et glandulis capitatis sessilibus consistente, ambitu triangulari-ovata, basi profunde cordata, apicem versus sensim angustata, acutiuscula, satis grosse crenata vel rarius dentato-crenata, media ca. 5—7 cm longa et 3.5—4.5 cm lata, superiora decrescentia et nonnunquam proportionem angustiora; folia floralia (supremis bracteiformibus exclusis) caulinis similia. Cymae 4—10(12)-florae in apice caulis et ramorum axillarium dissitae, inflorescentiam racemosam elongatam laxam formantes; cymae superiores pedunculis brevibus ad 5 mm longis, inferiores autem elongatis 2—2.5 cm longis praeditae, folia cymas fulcrantia 4—6 mm longa bracteis (3—4 mm longis) conformia, lanceolato-linearia; calyx 9—10 mm longus tubulosus vix incurvus, nervis 15 prominentibus, ore valde obliquo, dentibus triangularibus acuminatis, superioribus tubo triplo brevioribus, inferioribus paulo brevioribus; corolla coerulea, 19—24 mm longa, tubo longo tenui incurvo tertia parte e calyce excerto, in faucem latam ca. 3.5 mm lg. et 5 mm lat. ampliato; labium superius ca. 4 mm longum, ad medium in lobos binos latos partitum, labii inferi lobus medius 3.5—4 mm longus et 3.5 mm latus, apice emarginatus, dimidiis leviter concavis subnutantibus, lobi laterales oblique ovati 3 mm lg. et 3.5 mm lt.; stamina posteriora corollae labio superiori aequilonga; nuculae desunt.

Habitat in schistosis partis superioris regionis montanae arboreto-dumosae Tadzhikistaniae orientalis.

Typus. Asia media, Tadzhikistania orientalis in clivo occidentali montis Sufanmir-Tau jugi Vaksch, alt. 2650 m s. m., in schistosis, 1 VII 1932. fl. n° 438, N. Gontscharov, G. Grigorjew et V. Nikitin. (In Herb. Inst. bot. Ac. Sc. URSS conservatur).

Affinitas. Species nostra *N. Gontscharovii* Kudr. proxima, a qua caulibus valde ramosis (non subsimplicibus) foliis longius petiolatis patentibusque (non strictis) nec non floribus minoribus corollae tubo proportionem brevior bene differt.

31. Subsectio **Leiocarpae** Pojark. subsect. nov. — Nuculae laeves. Species plerumque Asiae centralis (imprimis Himalayae) incolae. Typus subsectionis: *N. cataria* L.

32. Subsectio **Tuberculatae** Pojark. subsect. nov. — Nuculae tuberculatae vel minutissime granulosaе.

Species Caucaso et regioni Mediterraneae propriae.

Typus subsectionis: *N. grandiflora* M. B.

33. **N. kubanica** Pojark. sp. nov.

Perennis; caules 30—55 cm alti robusti recti, brevissime crispule appresse dense pilosi, in parte inferiore purpureo colorati, 2.5—4.5 cm crassi, internodiis 15—17, inferioribus et in inflorescentia brevibus, ceteris elongatis 4—8 cm longis, a basi ramosi, ramis caule brevioribus inter se subaequilongis, inferioribus non raro brevibus sterilibus, superioribus cymarum paribus 3—5-ferentibus. Folia flavo-viridia, concoloria, pilis tenuibus appressis sub lente conspicuis tecta et glandulis sessilibus punctiformibus subtus crebre supra sparsim obsita, nervis subtus prominentibus, 2—5.5 cm longa, 0.5—1.2 cm lata, oblonga vel lanceolata usque ad anguste lanceolata, basi cuneata, in apicem acutiusculum sensim angustata, margine acutiuscule dentata, caulina suprema et ramularia non raro integerrima; petioli lamina 4—5-plo breviores, superiores quam ceteri breviores; folia floralia inferiora caulinis similia, superiora parva ovata, integerrima suprema ut cymas fulcrantia bracteiformia. Cymae 5—13-florae, plerumque iteratim laxe dichotomae, nonnunquam in racemum cymosum brevem abeuntes, ad apicem caulis ramorumque per paria 3—5 dispositae, paniculam cylindraceam brevem laxam formantes, superiores 3—7 mm inferiores 2.5—3 mm longe pedunculatae; floris centralis pedicellus 2—2.5 mm longus, lateralium autem 0.3—0.8 mm longus; bractee lineares 1.5—2.5 longae; calyx 6—7.5 (8) longus, extus coeruleo suffusus, breviter pubescens et glandulis sessilibus albidis luteisve sparse obsitus, tempore floreendi anguste tubulosus valde curvatus (in fructu oblongo-ovatus) ore valde obliquo subbilabiato, dente supremo recto lanceolato 1.5—2 (2.5) mm longo quam ceteri distincte longiore, tubi partem ampliata vix attingente vel paulo brevior, ceteris e basi lata in acumen curvatum subito angustatis; corolla 11—12 mm longa tubo in faucem latam ca. 2 mm longam et 3 mm latam ampliata, labio superiore in lobos duos fere semiorbiculatos ad medium vel ultra partito, labii superioris lobo medio 2.5—4 mm longo et 4—6 mm lato, concavo grosse dentato, lateralibus late triangularibus obtusis 1.2—1.8 mm longis et 2—2.5 mm latis; stamina posteriora labio superiori aequilonga; nuculae ellipsoideae 2—2.2 mm longae, 1—1.2 mm latae atrofuscae, vix conspicue crebre punctatae et disperse tuberculatae.

Habitat in clivis apertis lapidosis in dumetis et pinetis regionis montanae mediae et subalpinae, alt. 1200—2200 m s. m., Ciscaucasiae occidentalis et partis occidentalis jugi Caucasici maximi.

521 Typus. Caucasus, prov. Kuban ad fontes fl. Kuban prope Uczkuan, in declivibus lapidosis, ad vias, 1400—2200 m s. m. 15 VI 1900 fl. et fr. N. Desoulavi, exs. H. F. R. n° 934 (in Herb. Inst. bot. Ac. Sc. URSS conservatur).

Affinitas. A *N. cyanea* Stev. ramis axillaribus longis virgatis, foliis angustioribus, pubescentia alius-modi, floribus minoribus, corollae tubo comparato cum calyce longiore nec non cymis laxioribus paucifloris longius remotis differt.

34. *N. czegemensis* Pojark. sp. nov.

Perennis; radix lignosa crasse fibrosa; caules 30—50 cm alti et 2—3 mm crassi, ascendentes, non raro plus minusve arcuati, ob pilos brevissimos deorsum inclinatos dense cinereo pubescentes, internodiis mediis 4—7 cm longis, ramosi, ramis axillaribus inaequilongis fertilibus, vel inferioribus sterilibus; folia tenuia, dense breviter appresse cinereo pubescentia et glandulis luteis punctiformibus subtus crebre supra sparsim tecta, nervis tenuibus non prominentibus, caulina 1.8—3 cm longa, 0.9—1.5 mm lata oblongo-ovata usque ad lanceolata, basi truncata vel cuneata, apice obtusa vel acutiuscula, margine utrinque dentibus 5—10 acutiusculis vel obtusis nonnunquam remotis inconspicuis instructa, folia floralia inferiora caulinis similia vel late ovata, quam pedunculi longiora vel eis aequilonga, superiora bracteiformia; folia cymas fulcrantia (ut bracteae) linearia vel lanceolato-linearia 2—3 mm longa. Cymae satis laxae, superiores 2—6-florae, 5—8 mm longe pedunculatae, laxae approximatae, inferiores ad 2—4 cm inter se remotae, trichotomae, ad 4 cm longe pedunculatae, ad apicem caulis per paria 5—8(12) et ad apicem ramorum axillarium per paria 2—6 dispositae, paniculam laxam elongatam formantes; calyx (6.5)7—8.5 mm longus, extus dense coeruleo rarius albo villosus, florendi tempore anguste tubulosus (in fructu oblongo-ovatus) curvatus ore valde obliquo, dente supremo lateralibus longiore 1.5—2.5 mm longo, lateralibus et inferioribus subaequilongibus e basi lata in acumen longum subito angustatis; corolla 11—12 mm longa, tubi parte tenui calyce inclusa, labio superiore 2—3 mm longo ad medium in lobos obtusos partito, labii superioris lobis lateralibus oblique semiorbicularibus 1.2—1.5 mm longis. 1.8—2 mm latis, lobo medio transverse latiore 4.5—5 mm longo 6—7 mm lato, concavo grosse dentato. Nuculae fuscae 2—2.3 mm longae, 0.8—1 mm latae, oblongo-ellipsoideae, trigonae, apice rotundatae, basi angustatae, opacae, minute punctatae et disperse tuberculatae.

Habitat in steppis, in pinetis nec non in schistosis regionum mediae et subalpinae (alt. 1700—2500 m c. m.) jugi Caucasici majoris (in ditione fl. Terek).

Typus. Caucasus. Balkaria, ad. fl. Czegem supra pag. Bulungu, 11 VIII 1911, fl. et fr. E. et N. Busch (in Herb. Inst. Bot. Ac. Sc. URSS conservatur).

Affinitas. *N. cyaneae* Stev. habitu praecipue similis, sed calyce
522 minus curvato corollae tubo longiore, parte ampliata e calyce exserta,
inflorescentia laxa nec non nuculae sculptura alius-modi bene differt.

35. Sectio **Schizocalyx** Pojark. sect. nov. — Calyx anguste tubulosus, incurvus, ore valde obliquo fere bilabiato, antice profunde fissus, dentibus brevibus. Corollae tubus longus in faucem brevem latam subito ampliatus, parte angusta calyce sesqui-triplo longiore; labii inferioris lobus medius concavus, grosse dentatus. Bracteae calyce multo breviores. Nuculae laeves vel sub lente conspicue granulatae. Flores in cymas vel in semiverticillastos dispositae, superiores nonnunquam in capitulum congestae. Plantae perennes saepe ramosissimae, foliis cordatis vel deltoideis medio-cribus, 2—3(4) cm longis.

Species ca. 20 Caucasi, Iraniae nec non Asiae minoris orientalis incolae.

Typus sectionis: *N. fissa* C. A. M.

36. **N. Schischkinii** Pojark. sp. nov.

Perennis; radix solida lignosa ramosa, caules 30—60 cm alti, 3—5 mm diam. ascendentes acute quadranguli, pilis brevissimis eglandulosis basi incrassatis patentibus vel sursum deorsumve inclinatis scabri, parte basali simplices vel ramos foliatis steriles emittentes, superne ramorum elongatorum fertilium nonnunquam iteratim ramosorum paribus 3—5 praediti; folia flavo-viridia, satis firma, nervis supra impressis subtus prominentibus, utrinque pilis patentibus crispulis subtus densioribus tecta, caulina 2.5—4.5(5.2) cm longa, 0.8—2.4(3.2) cm lata, inferiora et media internodiis plerumque subaequilonga, petiolo 1.5—3-plo lamina brevior suffulta, late ovata vel ovata, basi truncata vel cuneata, rarissime cordata, apice obtusa, margine grosse crenata vel obtusiuscule dentata, superiora internodiis multo breviora, brevius (2.5—6 mm longe) petiolata, oblongo-lanceolata vel lanceolata, basi cuneata, sursum in apicem obtusum vel acutum sensim angustata, toto margine vel ad apicem tantum dentata vel superiora integerrima; folia floralia florendi tempore pedunculis longiora serius eis aequilonga vel paulo breviora, ambitu oblonga vel lanceolata, longe acuminata, integerrima, sursum valde diminuta, suprema fere bracteiformia. Cymae ad apicem caulis et ramorum 4—7(9)-nae paniculam laxam pyramidalem formantes, pedunculis 0.5—1 mm longis, inferioribus usque ad 4 mm longis, inferiores laxae trichotomae, axibus primariis initio 5—8 mm demum 12—20 mm longis; cymulae flos centralis sessilis, laterales pedicellati flores dioici; calyx rectus, florifer tubuloso-cylindraceus (8)9—11 mm longus, in fructu ovato-cylindraceus, plus minusve violaceo suffusus, dense pilis crassiusculis eglandulosis crispulis obsitus, ore fere recto, dentibus lineari-subulatis longe aristato-acuminatis, tubo plerumque paulo longioribus; corolla intense coerulea, 6.5—9 mm longa calyce inclusa (florum masculorum nonnunquam calyci aequilonga), extus appresse hirsuta, tubo

523 recto sub limbo ampliato, labio superiore quam inferius triplo longiore ad medium in lobos duos breves fisso, labii inferioris lobis lateralibus erectis oblique semiorbicularibus, lobo medio subflabelliformi 2—3 mm longo et 4.5—5 mm lato grosse dentato; florum masculorum stamina labio superiori aequilonga, stylus brevis, lobis parvis conniventibus; florum femineorum stylus e corolla ad 1.5—2 mm exsertus, lobis magnis revolutis, staminodia fauce inclusa parva antherarum rudimentis membranaceis. Nuculae late ellipsoideae, 2—2.2 mm longae, 0.7—0.8 mm latae, atrifuscae minute tuberculatae.

Habitat in clivis stepposis pratensibusque regionis montanae mediae Transcaucasiae australis orientalisque nec non in Talysch.

Typus. Azerbajdzhan austro-occidentalis, in angustiis Pir-Seid montis Bozdagh, 26 V 1911, fl. et fr. G. Woronow (in Herb. Inst. bot. Ac. Sc. URSS conservatur).

Affinitas. A speciebus proximis *N. ucrainica* L. et *N. kopetdaghensi* Pojark. nuculis distincte tuberculatis, foliis floralibus integerrimis nec non pubescentia alius-modi differt.

Hanc speciem in honorem cl. B. Schischkini florum URSS investigatoris diligentissimi dedico.

37. *N. kopetdaghensis* Pojark. sp. nov.

Planta perennis dense foliata, radice solida lignosa, non raro tortuosa, n rhizoma breve abeunte. Caules 25—65 cm alti, ad 5(6) mm crassi, acute quadranguli, indumento e pilis brevibus crispulis eglandulosis, imprimis in costis pilis longis pluricellularibus pellucidis (glutinosus?) arachnoideo-perplexis intermixtis, in parte inferiore autem nonnunquam copiosis, inferne simplices vel ramos breves steriles emittentes, in dimidio superiore ramorum foliatorum fertilium nonnunquam iteratim ramosorum paribus 5—8 praediti; folia flavo-viridia, tenuia, nervatura subtus distincte visibili sed non prominente, supra impressa, subtus plerumque dense rarius laxe pilis patentibus tenuibus crispulis pilis capitatis glandulosis intermixtis tecta, supra plerumque sparse appresse pilosa (folia superiora autem utrinque dense pubescentia), margine ciliata, caulina ad 4.5—5.5 cm longa et 2.2—2.5(3) cm lata, inferiora oblongo-ovata basi cordata vel truncata, obtusa, crenata, cetera lanceolata, basi cuneata sursum in apicem obtusatum sensim angustata, margine dentibus remotiusculis rectis vel extus inclinatis instructa; petioli inferiores lamina ca. sesquibreviores, saepe arachnoideo-villosi, superiores abbreviati plerumque breviter pubescentes, supremi subnulli; folia floralia lanceolata, dentata, suprema tantum integerima, florendi tempore pedunculis longiora deinde eis aequilonga vel paulum breviora. Inflorescentia pyramidato-paniculata; cymae praecipue triflorae, inferiores nonnunquam trichotomae, 8(10)-florae; pedunculi superiores 5—12 mm longi, inferiores ad 4.5—5 cm longi; cymarum flos centralis sessilis, florum lateralium pedicelli initio 2.5 mm longi, post

524 anthesin ad 10—13 mm longi; flores dioici; calyx florens cylindraceo-obconicus, 9—11 mm longus, fructifer ovatus, violaceus, tubo extus ob pilos longos tenues albos patentes tomentoso-villoso, ore fere recto, dentibus tubo paulo longioribus e basi lanceolata longe tenuiter acuminatis, pilis raris longis tectis; corolla 8.5—11 mm longa, calyci aequilonga vel rarius eo paulo brevior (florum masculorum nonnunquam vix longior), coerulea, extus puberula, tubo recto sub limbo ampliato, labio superiore quam inferius subtriplo longiore, in lobos duos rotundatos profunde dissecto, labii inferioris lobis lateralibus erectis oblique semiorbicularibus, lobo medio subflabelliformi; florum masculorum stamina posteriora labio superiore subduplo vel ad tertiam partem breviora; stylus brevis (filamentorum basin vix attingens), lobis parvis conniventibus; florum femineorum stylus corollae subaequilongus, lobis magnis revolutis, staminodia parva fauce inclusa antherarum rudimentis membranaceis, filamentis brevissimis. Nuculae late ellipsoideo-ovatae, 2.8 mm longae, 1.8 mm latae, brunneae, obscure tuberculatae.

Habitat in steppis et pratis jugi Kopetdagh a praemontio usque ad regionem subalpinam.

T y p u s. Regio transcaspica: Turcomania, prope Aschabad in montibus supra pagum Nefton, 4 V 1900, fl. P. Sintenis, n° 185 (in Herb. Inst. bot. Ac. Sc. URSS conservatur).

Affinitas. A speciebus proximis *N. ucrainica* L. et *N. Schischkinii* Pojark. pubescentia alius-modi differt, a priore etiam calycis forma, a secunda—nuculis inconspicue tuberculatis, floribus majoribus nec non foliis caulinis omnibus et floralibus saltem inferioribus dentatis.

38. *N. Fedtschenkoi* Pojark. sp. nov.

Annua, radix tenuis; caulis 6—28 cm altus, erectus, indumento denso cinerascenti e pilis eglandulosis albis basi plus minusve incrassatis deorsum inclinatis, fere semper ramulorum axillarium paria 2—3 emittens et nonnunquam ad ipsam basin ramosissimus, ramulis elongatis floriferis interdum iteratim ramosis; folia laete glaucescentia, subtus pallidiora, pilis brevibus eglandulosis patentibus densiuscule tecta, supra fere glabra vel sparse appresse pilosa, inferiora petiolo laminam paulo superante suffulta, (3)6—22 mm longa et (2.5)5—13 mm lata, fere rotundata vel late ovata, basi truncata vel cuneata, apice rotundata, integerrima vel emarginato-dentata, dentibus parvis acutis remotis, media inferioribus similia vel angustiora usque ad lanceolata, acuta, dentibus majoribus utrinque 4—6 praedita, petiolis laminae aequilongis, nervis crassiusculis sed vix prominentibus; folia superiora mediis nonnunquam conformia, saepius angustiora, lanceolata, nervo medio lateralibusque prominentibus, acuminata saepius non pungentia rarius in mucronem aculeatum attenuata, breviter petiolata, quam cyma longiora. Cymae 3—8-florae, earum paria 3—4 suprema in capitulum terminale 1.5—2 mm longum 16—30-florum congesta, caetera

525 dissita; cymae superiores sessiles vel pedunculis brevibus 2—5 mm longis suffultae, inferiores longe pedunculatae, pedunculis 2—6 cm longis; bractaeae virides vel plus minusve violaceo suffusae, anguste lanceolatae, rigidae, nervosae, incurvae, in mucronem pungentem attenuatae, exteriores calycibus longiores, interiores eis aequilongae vel paulo breviores. Flores sessiles; calyx 6—8 mm longus, florens anguste cylindraceus, fructifer ovatus, 13—15-nervius, rectus, ut bractaeae pilis basi incrassatis eglandulosis brevissimis (prope basin tantum longioribus) tectus, dentibus lanceolato-subulatis, rectis, margine ciliatis, intus ut sinus pilis longis setiformibus sursum inclinatis obsiti, superioribus 2—2.5 mm longis tubo sesqui—duplo longioribus, inferioribus paulo longiora, 2.3—2.7 mm longis; corolla 7.5—9 mm longa, ut videtur coerulescens, extus pilosa, fere ad limbum vel ad medium calyce inclusa, tubo tenui longo (5—6.5 mm longo) incurvo, in faucem parvam 1.4—1.7 mm longam ampliata, labio superiore erecto, 1.3—1.7 mm longo, in lobos duos semiorbiculare, breviter fisso, labii inferioris lobis lateralibus oblique ovatis, 0.8—1.2 mm longis et latis, patentibus, lobo medio unguiculato, lamina reniformi basi inflata integerrima; stamina posteriora labio superiore duplo breviora, anteriora faucis marginem vix excedentia; antherae coeruleae. Nuculae obovato-ellipsoideae, ca. 1.7 mm longae et 1 mm latae, pallide fuscae.

Habitat in declivibus lapidosis saxosisque regionis montanae stepposae Asiae mediae et Afghanistanae.

Typus. Tadzhikistania, jugum Zeravschanicum, prope pag. Madm, 5 VII 1913, fl. et fr. V. Komarov (in Herb. Inst. bot. Ac. Sc. URSS conservatur).

Affinitas. *N. pungenti* Benth. valde similis, a qua inflorescentia eglandulosa, corolla coerullescentia atque foliis floralibus omnibus vel saltem superioribus non pungentibus et lamina evoluta, non raro herbacea differt.

Species nova in honorem cl. B. Fedtschenko florum turkestanicae exploratoris diligentissimi nominata.

39. *N. microcephala* Pojark. sp. nov.

Annua; caulis 4—24 cm altus, tenuis, erectus vel subascendens, internodiis 4—5(7) elongatis, pilis albis minutissimis basi incrassatis eglandulosis nonnunquam glandulis capitatis intermixtis satis dense tectus, viridis vel purpureus, simplex vel pauciramosus, ramulis floriferis. Folia intense vel atroviridia, pagina superiore non raro purpurascenti, supra pilis brevibus appressis tecta, subtus indumento satis denso e pilis patentibus eglandulosis et glandulosis capitatis consistente, nervatura non prominente, inferiora late ovata, 5.3—20 mm longa et 7—14 mm lata, basi rotundata vel cuneata, obtusa vel rarius acuta, utrinque dentibus 3—6 remotis acutis parvis instructa, petiolo lamina paulo longiore suffulta, cetera (excepta capitulum terminale fulcrantia) inferioribus similia vel angustiora anguste elliptica usque

526 ad linearia, basi cuneatim angustata, apice acuta vel acuminata, emarginato-serrata, petiolo quam lamina triplo-duplo brevior; folia capitulum fulcrantia viridia vel violacea, anguste lanceolata, longe acuminata nonnunquam aculeata vel non raro bracteiformia, rigida, curvata, pungentia, capitulum vix excedentia. Cymae 3—5-florae laxiusculae, superiores sessiles in capitulum 7—12 mm longum et latum 5—10 (13)-florum congestae, ceterae dissitae, pedunculis tenuibus (1) 2—5.5 cm longis praeditae bractae rubescente-violaceae, calyci aequilongae vel paulo longiores; rigidae, anguste lanceolatae, nervo medio et lateralibus crassis, apice acuminatae, ut calyx pilis eglandulosis minutissimis et glandulis sessilibus brevistipitatisque dense tectae, margine sparse longiuscule ciliatae; flores sessiles; calyx florifer 5—7 mm longus, anguste cylindraceus, fructifer ovatus, 12—15-nervius, rectus, dentibus lanceolato-subulatis rectis, superioribus tubo duplo brevioribus, 3 mm longis, inferioribus vix longioribus, intus margineque ut sinus setis sursum inclinatis obsitis; corolla coerulescens (? vel coerulescente-lilacina); 6—7 mm longa, calyce vix longior vel nonnunquam paulo brevior, tubo 3—4 mm longo in faucem brevem ampliata, labio medio breviter bifido, labii inferioris lobis lateralibus valde obliquis, ovatis, lobo medio unguiculato lamina reniformi 0.6—0.8 mm longa, 1.2—1.3 mm lata, basi inflata; stamina posteriora labio superiore duplo breviora, anteriora faucis marginem vix attingentia; antherae coerulescae. Nuculae obovatae, 1.2—1.3 mm longae, 0.9—1 mm latae, fusco-luteae.

Habitat in clivis schistosis lapidosisque montium Asiae mediae occidentalis (Kopetdagh Balkhany, Badghyz), ca. 1200—1600 m s. m.

Typus. Turcomania, in montibus Bolschye Balkhany in ascensu ad m. Djuineg prope fontem Seutli, alt. 1200 m s. m. 25 V 1928, fl. et fr. E. Bobrov et A. Jarmolenko, n° 170 (in Herb. Inst. bot. Ac. Sc. URSS conservatur).

Affinitas. A speciebus proximis (*N. pungens* Benth., *N. Fedtschenkoi* Pojark., *N. chenopodiifolia* Stapf) capitulo terminali parvo paucifloro (cymis axillaribus magis minore), pedunculis omnibus elongatis (nec superioribus subnullis) floribus minoribus, corolla calyce fere inclusa bene differt.

40. *Neustruevia* Juz. gen. nov.

Calyx anguste obconicus nervis 5 distinctis fere costatis in dentes 5 subaequales spiniformes abeuntibus nervisque accessoriis inter eos parum conspicuis. Corolla bilabiata tubo incluso, intus infra staminum insertionem annulo pilorum denso intus praedito; labium superius erectum breve subquadrangulare leviter convexum, inferius porrectum amplum quam superius multo longius trilobum lobis lateralibus oblongo ovatis, lobo medio fere obcordato profunde emarginato, ambo extus dense et longe pilosi; stamina 4 exserta, postica anticis nonnihil breviora; filamenta pilosa; loculi

527 antherarum divaricati apice in loculum quasi unum confluentes fissura communi dehiscentes. Stylus staminis anticis aequilongus apice brevissime inaequaliter bilobus.

Suffrutex foliis pinnato lobatis. Verticillastri axillares densi et compacti; folia floralia valde diminuta; bracteae lineari-lanceolatae curvatae, rigidae spinescentes, basi plures connati. Corolla albida.

Genus medio-asiaticum monotypicum solum e montibus Karatau notum

41. **N. karatavica** Juz. sp. nov.

Suffrutex radice valde robusto longissimo ramoso lignescenti ca. 3—4 cm in diam.; caules plures 23—25 cm alt., basi reliquiis partium basalium petiolorum dense lanato pilosorum tecti, erecti et stricti robusti obsolete tetragoni breviter pubescentes; folia radicalia sicut haud numerosa caulina ambitu oblonga pinnatipartita partitionibus quoque profunde dissectis segmentis irregulariter obtusiuscule lobulato dentatis; nervis supra impressis subtus prominentibus; supra disperse subtus densiuscule et breviuscule pilosa et breviter stipitata glandulosa. Flores in verticillastos 1—3 densissimos et compactos valde remotos disposita ca. 3 cm diam.; folia floralia valde diminuta ca. 5 cm lg., profunde pinnatisecta petiolis longitudinem calycum non superantibus; bracteae rigidae lineari-lanceolatae vel subulatae hamato curvatae apice spinescentes, basi plures (vulgo ca. 5) inter se connatae calyces attingentes, pilis longis lanatis et glandulis breviter stipitatis tectae; flores ca. 1.4 cm lg.; calyx ca. 1 cm lg. dense et rigide pilosus acuminibus dentium fere glabris; corolla alba limbo extus densissime pubescente; nuculae ignotae.

Habitat in declivibus montium Karatau Asiae Mediae.

Typus. M. Karatau, loco dicto Kok-Bel, in declivibus agrilloso schistosis, 1936, fl., leg. G. Tekutjev sub n° 212; in Herbario Inst. Bot. Ac. Sc. URSS conservatur.

Affinitas. Unica species adhuc nota hujus generis, a generibus proximis *Eremostachyde* Bge. et *Pseuderemostachyde* M. Pop. styli ramis subaequalibus, a priore etiam filamentis basi exappendiculatis caeterisque notis optime distincti.

528 SUPPLEMENT

4a. *Teucrium ussuriense* Kom. in Izv. Bot. Sada AN SSSR XXX, vyp. 1-2 (1932) 208.

Perennial, with short branching whitish rhizome and creeping stolons rooting at nodes; stems ca. 50 cm long, erect, rather robust, simple or short-branching, deeply 4-furrowed, covered with whitish, downcurved hairs; leaves 8-12 pairs, 4-6 cm long, 1.8-2.4 cm wide, oblong-ovate, with truncate subcordate or broadly cuneate base, coarsely and often doubly serrate-dentate with 10-30 teeth on both margins, green short-hairy above, grayish-tomentose beneath, beset (like the whole plant) with small glands; petioles ca. 1 cm long, with indument as on stems; inflorescence compound, racemose, 10-20 cm long, rather broad, contracted, often interrupted; bracts small, about equaling calyx, lanceolate, ciliate at margin, otherwise subglabrous; pedicels short, glandular; calyx 5 mm long, campanulate, sparingly pubescent, with prominent network of nerves, mostly purplish, 2-lipped, the upper teeth broadly triangular, the 2 lower teeth narrower, acuminate; corolla purple, with short tube and limb, ca. 10 mm long; upper lateral lobes triangular-acuminate, ciliate-barbate at apex, the lower lateral lobes rounded, glabrous, the middle lobe large, rounded, broadly acuminate; filaments prominent, sparsely hairy at base; ovary glabrous; nutlets thus far unknown. August.

Riparian sands, mainly on cultivated soil, also among crops. — Far East: Uss. **Gen. distr.:** Ch. (Lyaodunskii Peninsula). Described from Suifun River valley, 5 km from Voroshilov. Type in Leningrad.

Note. This Chinese (Manchurian) species, akin to *T. japonicum* Willd., evidently occurs in the USSR as an introduction. It was discovered in 1930 at two points in Ussuri Territory (by Komarov and Shishkin) and apparently never since. It belongs perhaps among the "ephemerophytes."

529 Genus 1252.* *Meehania*** Britt.

In Bull. Torr. Bot. Club, XXI (1894) 32; Pflanzenfam. IV, 3a, 234.

Calyx campanulate or tubular-campanulate, 15-nerved, 2-lipped, 3 teeth of upper lip longer and narrower than the teeth of lower lip; corolla large, hairy within, the tube narrow at base, strongly expanding at the front; upper lip 2-lobed, short; lower lip about as

* Treatment by S.V. Yuzepchuk.

** Named after the American botanist Thomas Meehan.

long, 3-lobed, with broader emarginate middle lobe; all stamens parallel, ascending, shorter than upper lip of calyx, the anther-cells strictly parallel; nutlets ovoid, smooth. Herbs, with weak decumbent stems and radican creeping stolons; leaves cordate or ovate, acute, dentate; verticillasters forming terminal 1-sided spicate inflorescences.

Oligotypic genus, including besides the Soviet species one North American species.

1. *M. urticifolia* (Miq.) Makino in Bot. Mag. Tokyo, XIII (1899) 159; Kom. apud Palib. in Tr. Bot. Sada, XVIII (1900) 174; Kom. and Alis. Opredel. rast. Dal'nevost. kr. II, 899. — *Dracocephalum urticifolium* Miq. in Ann. Mus. Bot. Lugd.-Bat. II (1866) 109; Prolus. Fl. Jap. (1867) 41. — *D. sinense* S. Moore in Journ. Linn. Soc. XVII (1879) 385. — *Cedronella urticifolia* Maxim. in Mém. Biol. XII, 4 (1886) 528. — *Nepeta urticifolia* Bisset et Moore ex Cat. Tokyo, 154, sec. Palib. — *Glechoma urticifolia* Mak. in Bot. Mag. Tokyo, XXVII (1913) 153. — *lc.*: S. Moore l. c. tab. 16, f. 7; Somoku-Dzuse-tsu ed. Makino, XI (1912) tab. 50.

Perennial, with a small short rhizome; stems 15–35 cm long, weak, at first erect, later decumbent and producing long flagelliform shoots, these with elongate internodes, rooting at nodes; whole plant covered with scattered short hairs; leaves long-petioled, cordate-ovate, acute, crenate or crenate-dentate; verticillasters 2–6-flowered, distant, forming a loose 1-sided, spicate inflorescence; pedicels short; floral leaves ovate or ovate-lanceolate, resembling cauline leaves but much smaller, sessile, obscurely toothed; pedicels short; calyx tubular-campanulate, somewhat membranous, pale green, obliquely truncate at apex, hairy on nerves and in throat, the teeth acute; corolla 3–5 cm long, blue, with more intensely colored spot and stripes on lower lip. June–July.

Shady coniferous and mixed mountain forests. — Far East: Uss. **Gen. distr.:** China, Korea, Japan. Described from Japan (Keiske specimen). Type in Leyden (?).

530 Note. This is an East Asian representative of a genus with a characteristic “disjunctive” distribution area. *Meehania* is one of the striking, though not commonly cited, examples of genera common to China, Japan and Atlantic North America (so-called “Aza-Greevskaya disjunction”). It penetrates into the USSR only with an edge of its distribution area and counts among the rarities of the Far Eastern flora; it was first collected in the USSR in 1915 by T.P. Gordeev (Malaya El'dug River) and later by N. Zaushkevich (near Shkotov village) in 1923.

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VEGETATION REGIONS OF THE USSR

Abbreviated name	Full name
I. Arctic	
1. Arc. Eur.	Arctic (European part)
2. Nov. Z.	Novaya Zemlya
3. Arc. Sib.	Arctic (Siberia)
4. Chuk.	Chukchi
5. An.	Anadyr
II. European part	
6. Kar. -Lap.	Karelia-Lapland
7. Dv. -Pech.	Dvina-Pechora
8. Balt.	Baltic States
9. Lad. -Il'm.	Ladoga-Il'men
10. U. V.	Upper Volga
11. V. -Kama	Volga-Kama
12. U. Dnp.	Upper Dnieper
13. M. Dnp.	Middle Dnieper
14. V. -Don.	Volga-Don
15. Transv.	Transvolga area
16. U. Dns.	Upper Dniester
17. Bes.	Bessarabia
18. Bl.	Black Sea area
19. Crim.	Crimea
20. L. Don.	Lower Don
21. L. V.	Lower Volga
III. Caucasus	
22. Cisc.	Ciscaucasia
23. Dag.	Dagestan
24. W. Transc.	Western Transcaucasia
25. E. Transc.	Eastern Transcaucasia
26. S. Transc.	Southern Transcaucasia
27. Tal.	Talysh
IV. West Siberia	
28. Ob	Ob region (from the eastern slopes of the Urals to the Yenisei River)
29. U. Tob.	Upper Tobol

30. Irt.	Irtysh
31. Alt.	Altai
V. East Siberia	
32. Yenisei.	Yenisei
33. Lena-Kol.	Lena-Kolyma
34. Ang. -Say.	Angara River-Sayans
35. Dau.	Dauria
VI. Far East	
36. Kamch.	Kamchatka
37. Okh.	Okhotsk
38. Ze. -Bu.	Zeya-Bureya
39. Uda	Uda River area
40. Uss.	Ussuri
41. Sakh.	Sakhalin
VII. Soviet Central Asia	
42. Ar. -Casp.	Aral-Caspian
43. Balkh.	Lake Balkhash area
44. Dzu. -Tarb.	Dzungaria-Tarbatagai
45. Kyz. K.	Kyzyl-Kum
46. Kara K.	Kara-Kum
47. Mtn. Turkm.	Mountainous part of Turkmenistan
48. Amu D.	Amu Darya
49. Syr D.	Syr Darya
50. Pam. -Al.	Pamir-Alai
51. T. Sh.	Tien Shan

Accepted Regions for Indication of General Distribution of
Species Appearing in "Flora of the U. S. S. R."

I. Arc.	Arctic (Spitsbergen, Greenland and farther)
II. Scand.	Scandinavia (Norway, Denmark, Sweden, Finland)
III. Centr. Eur.	Central Europe (Germany, Poland, Czechoslovakia, Hungary, Austria, Switzerland)
IV. Atl. Eur.	Atlantic Europe (Netherlands, Belgium, England, France, Portugal)
V. Med.	Mediterranean (including North Africa)
VI. Bal. -As. Min.	Balkan Peninsula and Asia Minor
VII. Arm. -Kurd.	Lesser Armenia and Kurdistan
VIII. Iran.	Iran and Afghanistan
IX. Ind. -Him.	India and Himalayas
X. Dzu. -Kash.	[Dzungaria-Kashgar area] Eastern or Chinese Turkestan (Sinkiang)

XI. Mong.	Mongolia
XII. Jap.-Ch.	Japan and China
XIII. Ber.	North American coast of the Bering Sea
XIV. N. Am.	North America (U. S. A. and Canada)
XV. Tib.	Tibet

Other Geographical Abbreviations

Afr.	Africa
Aust.	Australia
Centr.	Central
E.	East(ern)
Gr.	Great, Greater
I.	Island
Is.	Islands
Mt.	Mount
Mts.	Mountains
N.	North(ern)
R.	River
S.	South(ern)
W.	West(ern)

TRANSLATOR'S NOTE

1. The Russian term "Srednyaya Aziya" is, in English, Central Asia (or Soviet Central Asia). Therefore the term Middle Asia has been used for Russian "Tsentral'naya Aziya," which is non-Soviet inner Asia, comprising western China (Sinkiang and Tibet) and Mongolia.

2. According to Russian usage, the European part of the USSR is "eastern Europe." Therefore "western Europe" includes the whole of Europe outside the USSR.

EXPLANATORY LIST OF ABBREVIATIONS OF RUSSIAN
INSTITUTIONS AND PERIODICALS APPEARING
IN THIS TEXT

Abbreviation	Full name (transliterated)	Translation
Bot.-geogr. issled. v Turkest.	Botaniko-geograficheskie issledovaniya v Turkestane	Botanical and Geographical Investigations in Turkestan
Bot. Mat. Gerb. Bot. inst. AN SSSR	Botanicheskie Materialy Gerbariya Botaniches- kogo instituta AN SSSR	Botanical Materials of the Herbarium of the Botanical Institute of the Academy of Sciences of the USSR
Bot. Mat. Gerb. Gl. Bot. Sada	Botanicheskie Materialy Gerbariya Glavnogo Botanicheskogo Sada	Botanical Materials of the Herbarium of the Main Botanical Gardens
Bot. zap. SPb. univ.	Botanicheskie zapiski Sankt-Peterburgskogo universiteta	Botanical Notes of St. Petersburg University
Bot. zhurn. SSSR	Botanicheskii zhurnal SSSR	Botanical Journal of the USSR
Byull. Glavn. Bot. Sada	Byulleten' Glavnogo Botanicheskogo Sada	Bulletin of the Main Botanical Gardens
Byull. Obshch. lyubit. estest- vozn., etnogr.	Byulleten' Obshchestva lyubitelei estestvozna- niya, antropologii i etnografii	Bulletin of the Naturalists', Anthropologists' and Ethnographers' Society
Byull. Voronezh. obshch. estestv.	Byulleten' Voronezhskogo obshchestva estestvo- ispytatelei	Bulletin of the Voronezh Society of Naturalists
Dendr.	Dendarii	Arboretum
Der. i kust.	Derev'ya i kustarniki	Trees and Shrubs
Der. i kust. Kavk.	Derev'ya i kustarniki Kavkaza	Trees and Shrubs of the Caucasus
Dikie polezn. i tekhnich. raste- niya SSSR	Dikie poleznye i tekhnichesk- skie rasteniya SSSR	Useful Wild Plants and Industrial Crops of the USSR
Dikorastushchie r. Kavkaza, ikh rasprostranenie, svoistva i pri- menenie	Dikorastushchie raste- niya Kavkaza, ikh ras- prostranenie, svoistva i primeneniye	Wild Plants of the Caucasus, Their Distribution, Properties and Uses
Dokl. AN Azerb. SSR	Doklady Akademii Nauk Azerbaidzhanskoi SSR	Reports of the Academy of Sciences of the Azerbaijan SSR

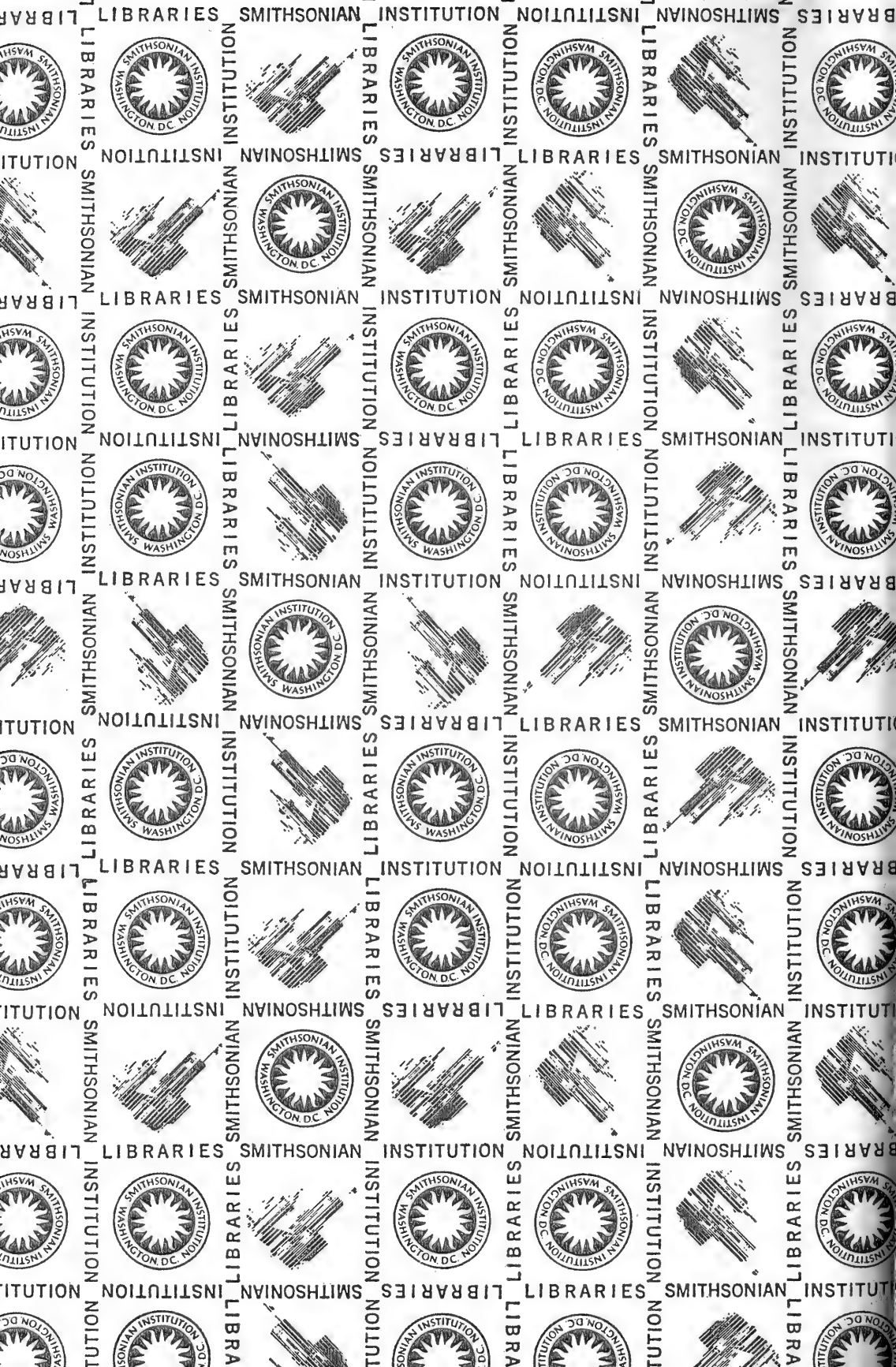
Fl.	Flora	Flora
Fl. Abkh.	Flora Abkhazii	Abkhasian Flora
Fl. Almat. zapovedn.	Flora Alma-Atinskogo zapovednika	Flora of the Alma-Ata Reserve
Fl. Alt.	Flora Altaya	Altai Flora
Fl. Alt. i Tomsk. gub.	Flora Altaiskoi i Tomskoi gubernii	Flora of Altai and Tomsk Provinces
Fl. Az. Ross.	Flora Aziatskoi Rossii	Flora of Asiatic Russia
Fl. Evrop. Rossii	Flora Evropeiskoi Rossii	Flora of European Russia
Fl. Gruzii	Flora Gruzii	Georgian Flora
Fl. Kamch.	Flora Kamchatki	Kamchatkan Flora
Fl. Kavk.	Flora Kavkaza	Caucasian Flora
Fl. Man'chzh.	Flora Man'chzhurii	Manchurian Flora
Fl. Mosk. gub.	Flora Moskovskoi gubernii	Flora of Moscow Province
Fl. Sev. Kraya	Flora Severnogo Kraya	Flora of the Northern Territory
Fl. Sakh.	Flora Sakhalina	Flora of Sakhalin
Fl. Sib.	Flora Sibiri	Siberian Flora
Fl. Sib. i Dal'n. Vost.	Flora Sibiri i Dal'nego Vostoka	Flora of Siberia and the Far East
Fl. Sr. Ross.	Flora Srednei Rossii	Flora of Central Russia
Fl. Talysh.	Flora Talysha	Talysh Flora
Fl. Tsentr. Kazakhst.	Flora Tsentral'nogo Kazakhstana	Flora of Central Kazakhstan
Fl. Vost. Evr. Ross.	Flora Vostochnoi Evropeiskoi Rossii	Flora of East European Russia
Fl. Yugo-Vost.	Flora Yugo-Vostoka	Flora of the Southeast
Fl. Yugo-zap. Ross.	Flora Yugo-zapadnoi Rossii	Flora of Southwest Russia
Fl. Yur. bot. -sada	Flora Yur'evskogo botanicheskogo sada	Flora of Yur'ev Botanical Garden
Fl. Zap. Sib.	Flora Zapadnoi Sibiri	Flora of West Siberia
Gerb. donsk. fl.	Gerbarii donskoi flory	Herbarium of Don Flora
Gerb. Orlovsk. gub.	Gerbarii Orlovskoi gubernii	Herbarium of Orel Province
Gerb. Ukr. fl.	Gerbarii Ukrainskoi flory	Herbarium of Ukrainian Flora
GRF	Gerbarii Russkoi Flory	Herbarium of Russian Flora
Ill. Fl. Mosk. gub.	Ilyustrirovannaya Flora Moskovskoi gubernii	Illustrated Flora of Moscow Province
Izv. AN SSSR	Izvestiya AN SSSR	Bulletin of the Academy of Sciences of the USSR
Izv. Bot. Sada	Izvestiya Botanicheskogo Sada	Bulletin of the Botanical Gardens
Izv. Bot. Sada Petra Vel.	Izvestiya Botanicheskogo Sada Petra Velikogo	Bulletin of Peter the Great Botanical Gardens
Izv. Gl. Bot. Sada	Izvestiya Glavnogo Botanicheskogo Sada	Bulletin of the Main Botanical Gardens
Izv. Kavk. Muzeya	Izvestiya Kavkazskogo Muzeya	Bulletin of the Caucasian Museum

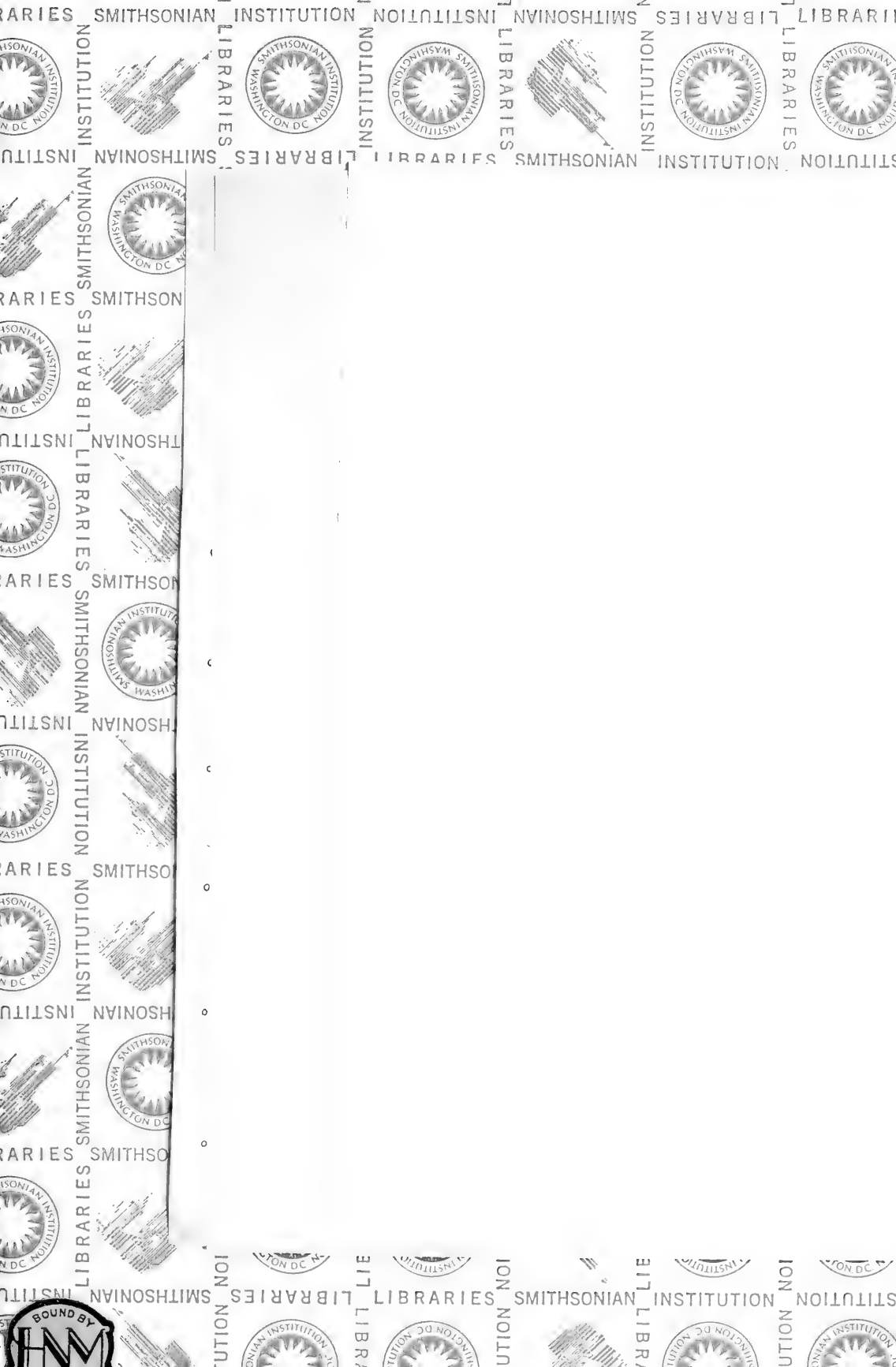
Izv. Kazakhst. fil. AN SSSR	Izvestiya Kazakhstan- skogo Filiala Akademii Nauk SSSR	Bulletin of the Kazakhstan Branch of the Academy of Sciences of the USSR
Izv. Kievsk. Bot. Sada	Izvestiya Kievskogo Botanicheskogo Sada	Bulletin of the Kiev Botan- ical Gardens
Izv. Obshch. lyubit. estest- vozn., antrop. i etnogr.	Izvestiya Obshchestva lyubitelei estestvo- znaniya, antropologii i etnografii	Bulletin of the Naturalists', Anthropologists' and Ethnographers' Society
Izv. Tadzhik. Bazy AN SSSR	Izvestiya Tadzhikskoi Bazy Akademii Nauk SSSR	Bulletin of the Tadzhikistan Base of the Academy of Sciences of the USSR
Konsp. rast. okr. Khar'kova	Konspekt rastenii okruga Khar'kova	Compendium of Plants of Kharkov District
Korm. rast. Estestv. senoko- sov i pastb. SSSR	Kormovye rasteniya estestvennykh senokosov i pastbishch SSSR	Fodder Plants of Natural Hay Meadows and Pastures of the USSR
Lesn. zhurn.	Lesnoi zhurnal	Forestry Journal
Mat. (dlya) Fl. Kavk.	Materialy dlya Flory Kavkaza	Materials on Caucasian Flora
Mat. (dlya) fl. Sredn. Azii	Materialy dlya flory Srednei Azii	Materials on Soviet Central Asian Flora
Nov. obozr.	Novoe obozrenie	New Review
Ob. rast. Kievsk. uch. okr.	Obzor rastitel'nosti Kiev- skogo uchebnogo okruga	Survey of Vegetation in the Kiev Educational District
Och. obozr. i fl. Karpāt	Ocherki rastitel'nosti i flory Karpāt	Survey of Carpathian Vegetation and Flora
Ocherk. Tifl. fl.	Ocherki Tiflisskoi flory	Survey of Tiflis [Tbilisi] Flora
Opis. Amur. obl.	Opisanie Amurskoi oblasti	Description of the Amur Region
Opis. ist. razv. fl. vost. Tyan'- Shanya	Opisanie istorii razvitiya flory vostochnogo Tyan'-Shanya	Description of the History of the Development of Flora of Eastern Tien Shan
Opis. nov. rast Turk.	Opisanie novykh rastenii Turkestana	Description of New Plants of Turkestan
Opis. nov. vidov	Opisanie novykh vidov	Description of New Species
Opred. der. i kust.	Opredelitel' derev'ev i kustarnikov	Key to Trees and Shrubs
Opred. rast. Dal'nevost. kr.	Opredelitel' rastenii Dal'nevostochnogo Kraya	Key to Plants of the Far Eastern Territory
Opred. rast. Kavk.	Opredelitel' rastenii Kavkaza	Key to Caucasian Plants
Opred. vyssh.	Opredelitel' vysshikh rastenii	Key to Higher Plants
Opred. (vyssh.) rasten. Evrop. chasti SSSR	Opredelitel' (vysshikh) rastenii Evropeiskoi chasti SSSR	Key to Higher Plants of the European USSR

Perech. rast. Turk.	Perechen' rastenii Turkmenii	List of Turkmenian Plants
Pochv. eksped. v bass. r. Syr- Dar'i i Amu- Dar'i	Pochvennaya ekspeditsiya v basseiny rek Syr-Dar'i i Amu-Dar'i	Soil Science Expedition to the Syr-Darya and Amu-Darya River Basins
Putesh. Rast. i fl. Karp.	Puteshestviya Rasteniya i flora Karpat	Travels Plants and Flora of the Carpathians
Rast. letn. pastb. Gandzh.	Rasteniya letnikh pastbishch Gandzhi	Vegetation of Gandzha [now Kirovabad] Summer Pastures
Rast. res. Turkm.	Rastitel'nye resursy Turkmenii	Plant Resources of Turkmenia
Rast. resursy Kavkaza	Rastitel'nye resursy Kavkaza	Plant Resources of the Caucasus
Rast. Sib.	Rastitel'nost' Sibiri	Vegetation of Siberia
Rast. Sr. Az.	Rastitel'nost' Srednei Azii	Vegetation of Soviet Central Asia
Rast. Zakasp. obl.	Rastitel'nost' Zakaspiiskoi oblasti	Vegetation of the Trans- caspian Region
Rastit. Kavk.	Rastitel'nost' Kavkaza	Vegetation of the Caucasus
Rastit. pokrov vost. Pamira	Rastitel'nyi pokrov vostochnogo Pamira	Plant Cover of the Eastern Pamirs
Rastit. syr'e Kazakhst.	Rastitel'noe syr'e Kazakhstana	Plant Resources of Kazakhstan
Rastit. zapovedn. Guralash i Zaaminks. lesn. ugodii	Rastitel'nost' zapovednika Guralash i Zaaminskikh lesnykh ugodii	Vegetation of Guralash Reserve and Zaamin Forest Lands
Rezul't. dvukh puteshestv. na Kavk.	Rezul'taty dvukh puteshestvii na Kavkaz	Results of Two Travels to the Caucasus
Russk. Fl.	Russkaya Flora	Russian Flora
Russk. lek. rast.	Russkie lekarstvennye rasteniya	Russian Medicinal Plants
Sbor, sushka i raz. lek. rast.	Sbor, sushka i razvitie lekarstvennykh rastenii	Gathering, Drying and Development of Medicinal Plants
Sorn. rast. SSSR	Sornye rasteniya SSSR	Weed Plants of the USSR
Sov. Bot.	Sovetskaya Botanika	Soviet Botany
Spis. rast.	Spisok rastenii	List of Plants
Tr. Bot. inst. AN SSSR	Trudy Botanicheskogo instituta AN SSSR	Transactions of the Botani- cal Institute of the Aca- demy of Sciences of the USSR
Tr. Bot. Sada	Trudy Botanicheskogo Sada	Transactions of the Botanical Gardens
Tr. Bot. Sada Yur'evsk. Univ.	Trudy Botanicheskogo Sada Yur'evskogo Universiteta	Transactions of the Botani- cal Gardens of Yur'ev [now Tartu] University

Tr. Byuro prikl. Bot.	Trudy Byuro po prikladnoi botanike	Transactions of the Bureau of Applied Botany
Tr. Dal'nevost. bazy AN SSSR	Trudy Dal'nevostochnoi bazy AN SSSR	Transactions of the Far Eastern Base of the Academy of Sciences of the USSR
Tr. Inst. nov. lub. syr'ya	Trudy Instituta novogo lubyanogo syr'ya	Transactions of the Institute of New Fiber Raw Materials
Tr. Nauk.-Doslid. Inst. Bot. Khar. Derzh. Univ.	Trudy naukovo-doslidnoho instytutu botaniky Kharkivs'koho Derzhavnoho Universytetu	Transactions of the Botanical Research Institute of the Kharkov State University
Tr. Obshch. isp. prir. Khar'k. univ.	Trudy Obshchestva ispytatelei prirody Khar'kovskogo universiteta	Transactions of Naturalists' Society of Kharkov University
Tr. Obshch. sadov. v Odesse	Trudy obshchestva sadovodov v Odesse	Transactions of the Odessa Horticulturists' Society
Tr. Odessk. obshch. sadov	Trudy Odesskogo obshchestva sadovodov	Transactions of Odessa Horticulturists' Society
Tr. Peterb. obshch. estestvoisp.	Trudy Peterburgskogo obshchestva estestvoispytatelei	Transactions of St. Petersburg Naturalists' Society
Tr. pochv.-bot. eksp. Peresl. upr.	Trudy pochvenno-botanicheskoi ekspeditsii Pereslavskogo upravleniya	Transactions of the Soil-Botanical Expedition of Pereslavl Administration
Tr. po geobot. obsled. pastb. Azerb.	Trudy po geobotanicheskim obsledovaniyam pastbishch Azerbaidzhana	Transactions of Geobotanical Investigations of Azerbaijan Pastures
Tr. Odessk. otd. R. obshch. sadov.	Trudy Odesskogo otdeleniya Rossiiskogo obshchestva sadovodov	Transactions of Odessa Branch of the Russian Horticulturists' Society
Tr. prikl. bot. (gen. i sel.)	Trudy po prikladnoi botanike, genetike i selektsii	Transactions of Applied Botany, Genetics and Selection
Tr. Ross. Obshch. sadov.	Trudy Rossiiskogo obshchestva sadovodov	Transactions of the Russian Horticulturists' Society
Tr. SAGU	Trudy Sredneaziatskogo Gosudarstvennogo Universiteta	Transactions of the Soviet Central Asian State University
Tr. Sarat. obshch. estestvoisp.	Trudy Saratovskogo obshchestva estestvoispytatelei	Transactions of the Saratov Naturalists' Society
Tr. Sil'sko-gospod. komit. bot.	Trudy sil'skohospodarskogo komiteta botaniky	Transactions of the Botanical Agricultural Committee
Tr. SPb. obshch. estestv.	Trudy Sankt-Peterburgskogo obshchestva estestvoispytatelei	Transactions of the St. Petersburg Naturalists' Society

Tr. Tadzh. bazy AN SSSR	Trudy Tadzhikskoi bazy AN SSSR	Transactions of the Tadzhikistan Base of the Academy of Sciences of the USSR
Tr. Tbil. bot. inst.	Trudy Tbilisskogo botani- cheskogo instituta	Transactions of Tbilisi Botanical Institute
Tr. Tbil. (or Tifl.) bot. sada	Trudy Tbilisskogo (Tiflisskogo) botaniche- skogo sada	Transactions of the Tbilisi (Tiflis) Botanical Garden
Tr. Turkmensk. bot. sada	Trudy Turkmenskogo botanicheskogo sada	Transactions of the Turkmenian Botanical Garden
Tr. Turk. nauchn. obshch.	Trudy Turkmenskogo nauchnogo obshchestva	Transactions of the Turkmenian Scientific Society
Vest. Akad. Nauk (or AN) Kazakhsk. SSR	Vestnik Akademii Nauk Kazakhskoi SSR	Bulletin of the Academy of Sciences of the Kazakh SSR
Vestn. estestv. nauk	Vestnik estestvennykh nauk	Bulletin of Natural Sciences
Vestn. Ross. Obshch. sadov	Vestnik Rossiiskogo obshchestva sadovodov	Bulletin of the Russian Horticulturists' Society
Vest. Tifl. bot. sada	Vestnik Tiflisskogo botanicheskogo sada	Bulletin of Tiflis Botanical Garden
Visn. Kyivsk. bot. sadu	Visnyk Kyivsk'ogo Botanichnogo Sadu	Bulletin of the Kiev Botanical Garden
Vyzn. (or Vznachn.) rosl. URSS	Vyznachnyk rosl. URSS	Key to Plants of the Ukrainian SSR
V obl. polupustyni	V oblasti polupustyni	(In the) Semidesert Region
Yadov. rast. lugov i pastb.	Yadovitye rasteniya lugov i pastbishch	Poisonous Plants of Meadows and Pastures
Zam. po sist. i geogr. rast. Tbil. bot. inst.	Zametki po sistematike i geografii rastenii Tbilisskogo botaniche- skogo instituta	Notes on Taxonomy and Geography of Plants of the Tbilisi Botanical Institute
Zam. po fl. EL'T	Zametki po flore El'tona	Notes on the Flora of Elton
Zap. Kievsk. Obshch. Estestv.	Zapiski Kievskogo obshche- stva estestvoispytatelei	Reports of the Kiev Society of Naturalists
Zap. NOVOROSS. obshch. Estestv.	Zapiski Novorossiiskogo obshchestva estestvoispy- tatelei	Reports of the Novorossiisk Society of Naturalists
Zap. Russk. geogr. obshch.	Zapiski Russkogo geogra- ficheskogo obshchestva	Reports of the Russian Geographical Society
Zhurn. Bot. obshch.	Zhurnal Botanicheskogo obshchestva	Journal of the Botanical Society
Zhurn. opyt. n. agron. Yugo- Vost.	Zhurnal opytnoi agronomii Yugo-Vostoka	Journal of Experimental Agronomy of the Southeast



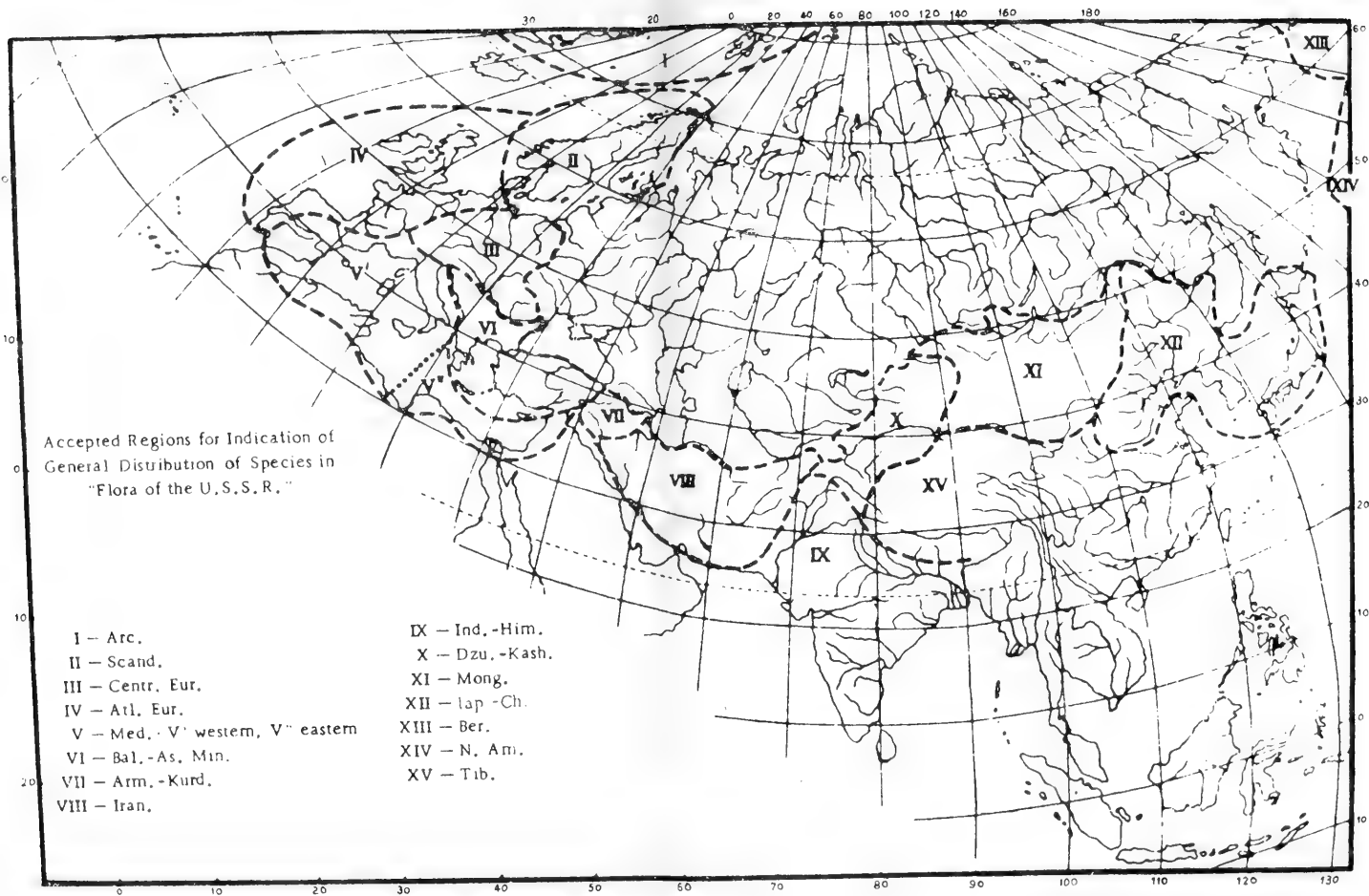


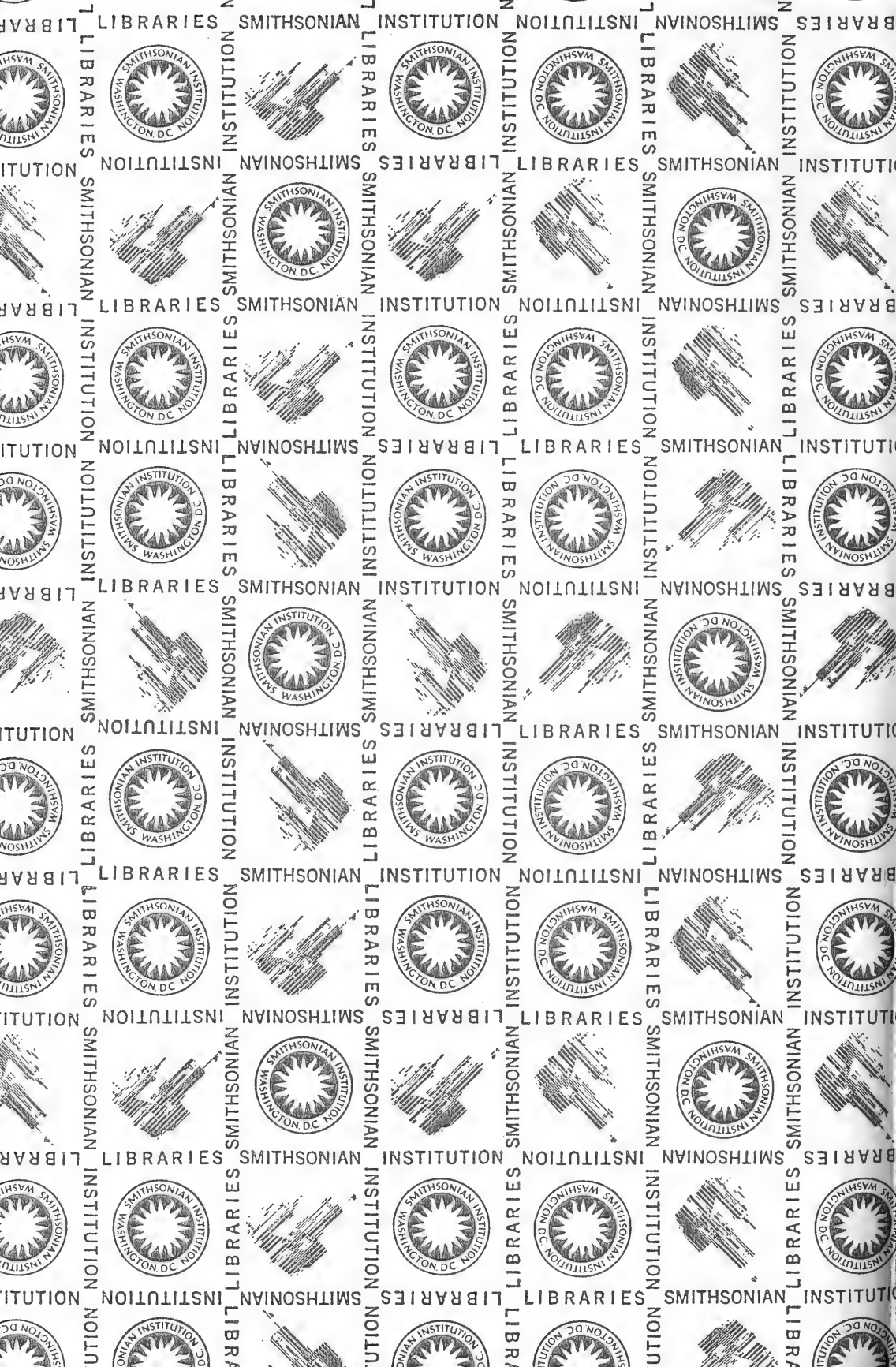


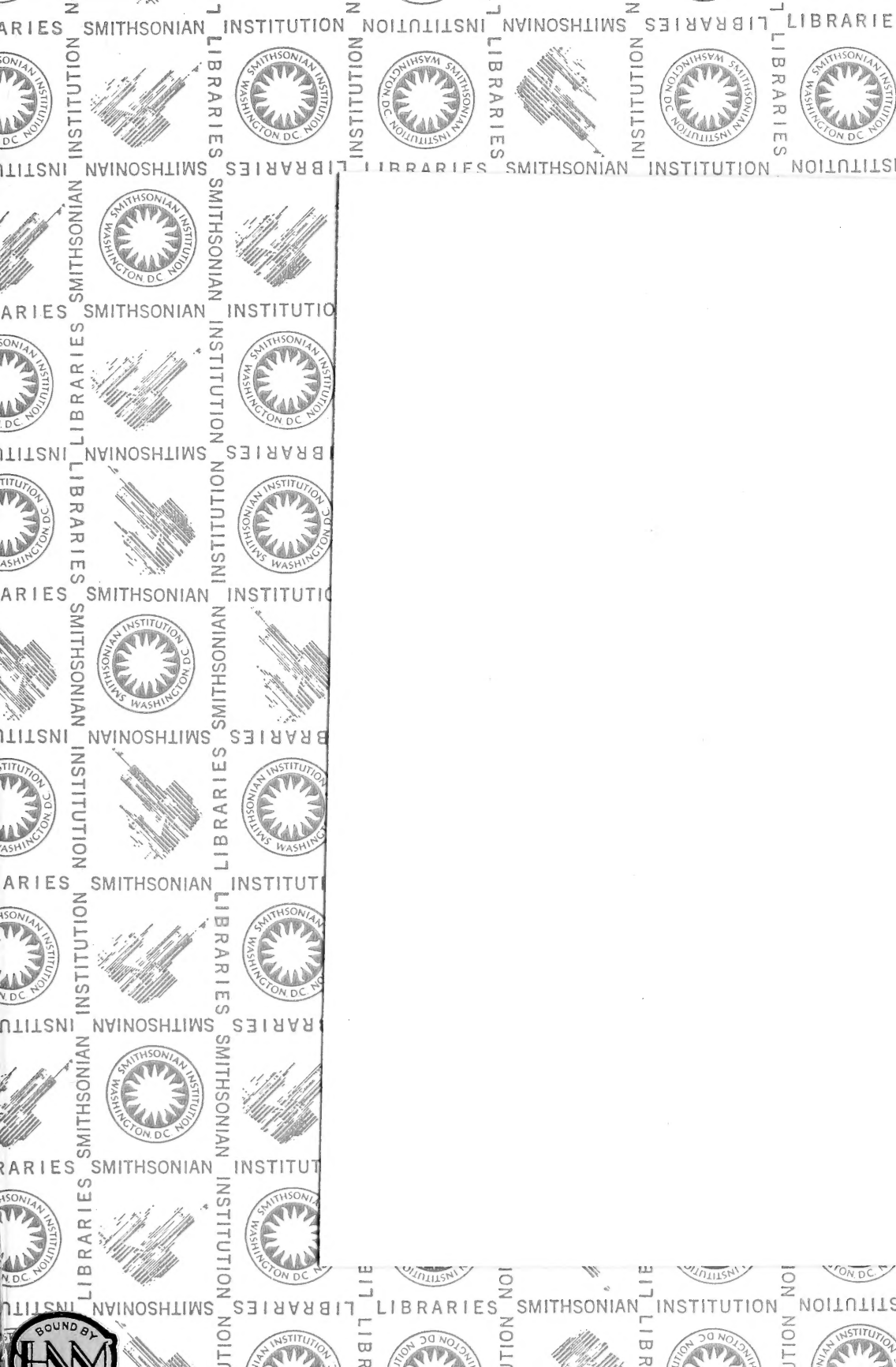
Accepted Regions for Indication of
General Distribution of Species in
"Flora of the U.S.S.R."

I — Arc.
II — Scand.
III — Centr. Eur.
IV — Atl. Eur.
V — Med., V' western, V'' eastern
VI — Bal., -As, Min.
VII — Arm., -Kurd.
VIII — Iran.

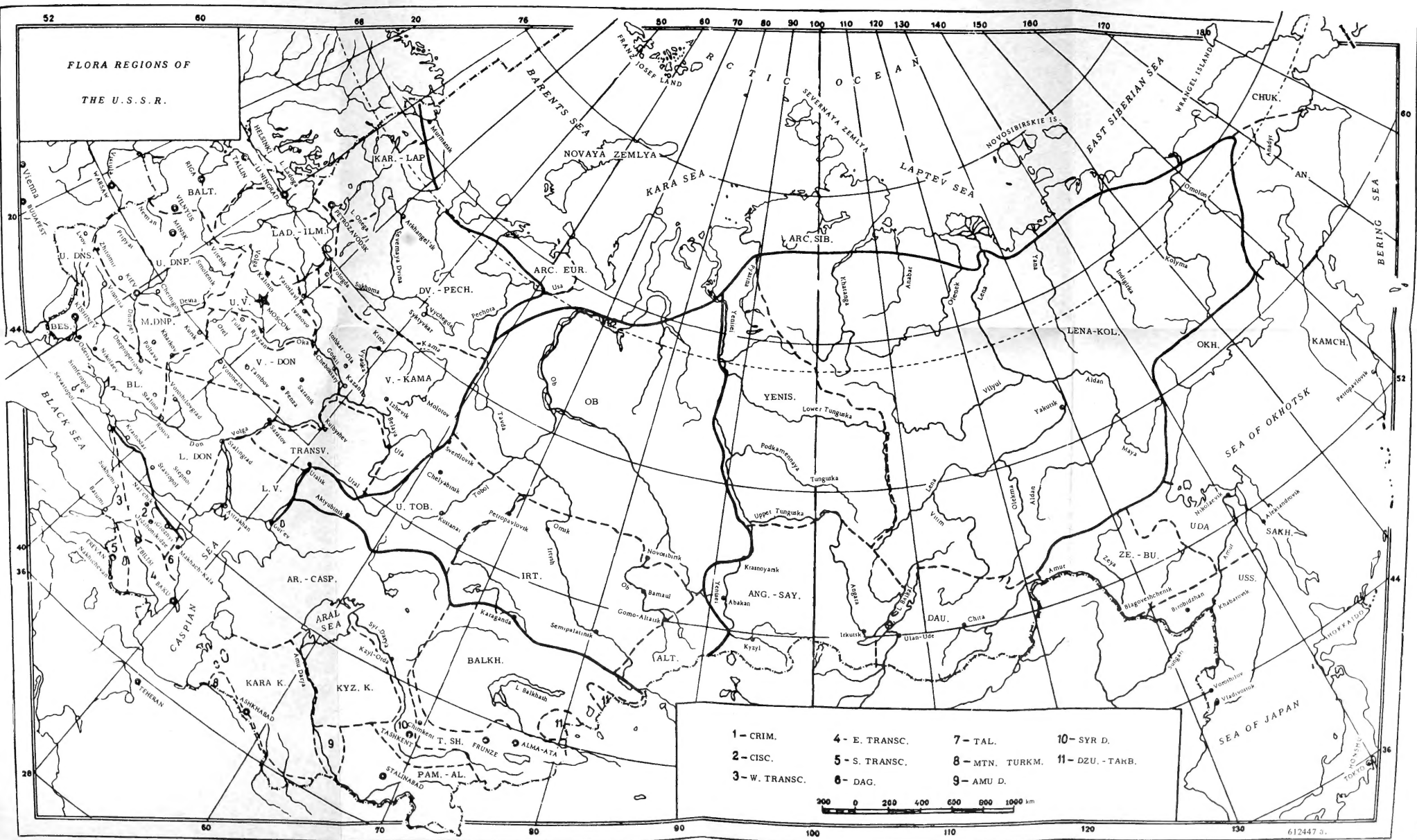
IX — Ind., -Him.
X — Dzu., -Kash.
XI — Mong.
XII — lap., -Ch.
XIII — Ber.
XIV — N. Am.
XV — Tib.







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